



Aphyllorphoroid fungi in insular woodlands of eastern Ukraine

Alexander Ordynets[‡], Anton Savchenko[§], Alexander Akulov[!], Eugene Yurchenko[¶], Vera F. Malysheva[#],
Urmaz Kõljalg[§], Josef Vlasák[□], Karl-Henrik Larsson[«], Ewald Langer[‡]

[‡] Department of Ecology, University of Kassel, Kassel, Germany

[§] Institute of Ecology and Earth Sciences, University of Tartu, Tartu, Estonia

| V.N. Karazin Kharkiv National University, Kharkiv, Ukraine

[¶] Department of Biotechnology, Paleski State University, Pinsk, Belarus

[#] Komarov Botanical Institute of the Russian Academy of Sciences, Saint Petersburg, Russia

[□] Biology Centre of the Czech Academy of Sciences, České Budějovice, Czech Republic

[«] Department of Research and Collections, University of Oslo, Natural History Museum, Oslo, Norway

Corresponding author: Alexander Ordynets (a.ordynets@uni-kassel.de)

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Abstract

Background

Fungi play crucial roles in ecosystems and are among the species-richest organism groups on Earth. However, knowledge on their occurrence lags behind the data for animals and plants. Recent analyses of fungal occurrence data from Western, Central and Northern Europe provided important insights into response of fungi to global warming. The consequences of the global changes for biodiversity on a larger geographical scale are not yet understood. Landscapes of Eastern Europe and particularly of eastern Ukraine, with their specific geological history, vegetation and climate, can add substantially new information about fungal diversity in Europe.

New information

We describe the dataset and provide a checklist of aphylophoroid fungi (non-gilled macroscopic *Basidiomycota*) from eastern Ukraine sampled in 16 areas between 2007 and 2011. The dataset was managed on the PlutoF biodiversity workbench (<http://dx.doi.org/10.15156/BIO/587471>) and can also be accessed via Global Biodiversity Information Facility (GBIF, parts of datasets <https://doi.org/10.15468/kuspj6> and <https://doi.org/10.15468/h7qtfD>). This dataset includes 3418 occurrences, namely 2727 specimens and 691 observations of fructifications belonging to 349 species of fungi. With these data, the digitised CWU herbarium (V. N. Karazin Kharkiv National University, Ukraine) doubled in size. A most detailed description of the substrate's properties and habitat for each record is provided. The specimen records are supplemented by 26 nuclear ribosomal DNA ITS sequences and six 28S sequences. Additionally, 287 photographs depicting diagnostic macro- and microscopic features of fungal fruitbodies as well as studied habitats are linked to the dataset. Most of the specimens have at least one mention in literature and relevant references are displayed as associated with specimen data. In total, 16 publication references are linked to the dataset. The dataset sheds new light on the fungal diversity of Eastern Europe. It is expected to complement other public sources of fungal occurrence information on continental and global levels in addressing macroecological and biogeographical questions.

Keywords

Basidiomycota, Agaricomycetes, diversity, checklist, wood-inhabiting fungi, ectomycorrhizal fungi, corticioid fungi, polypore fungi, substrate, dead wood, Kharkiv, Donetsk, Luhansk, Nature Reserve, National Park

Introduction

Fungi play crucial roles in ecosystems and are among the species-richest organism groups on Earth (Mora et al. 2011, Heilmann-Clausen et al. 2014, Peay et al. 2016). However, their occurrence has been poorly documented so far due to the difficulties of species detection, identification and delimitation. The situation is now rapidly changing due to substantial improvements in the methods used to identify and communicate the taxa of fungi (Köljalg et al. 2013, Hibbett et al. 2016). On the other hand, possibilities to digitise the taxon occurrences during the few last years have been additionally improved, providing great benefits for all biodiversity researchers including mycologists (Abarenkov et al. 2010, Senderov et al. 2016).

Europe is the continent with the most advanced knowledge of fungal diversity due to a long-standing tradition of mycological research (Dahlberg et al. 2010). In the last decades, numerous national projects documenting fungal diversity have been initiated. Furthermore,

national efforts have been consolidated into the international projects. Such cooperation enables researchers to investigate important ecological questions, for example, species- and community-level responses of fungi to global warming (Andrew et al. 2016, Kauserud et al. 2012). Answering macroecological questions may be facilitated by broad spatial coverage of the dataset, as exemplified by "Climate Change Impacts on the Fungal Ecosystem Component" project, ClimFun (Andrew et al. 2017). There is a place to further expand geographic coverage of successful projects such as ClimFun, but this requires filling sampling gaps and digitisation efforts for national datasets, especially from Eastern Europe. In this region, sparse data availability and accessibility generally result from low numbers of both professional mycologists and citizen scientists (Dahlberg et al. 2010).

The environment of eastern Ukraine (Kharkiv, Donetsk and Luhansk regions) offers a special possibility to study fungal diversity associated with woody plants. Severe continental climate substantially limits the distribution of forests on the local scale, resulting in forest patches of limited size. These "forest oases" are separated from each other by the steppe vegetation or human-managed lands (Popovych 1990). Unlike the other parts of Ukraine and Europe, the European beech and Norway spruce are totally absent in the forests, while pedunculate oak and other numerous deciduous trees form a forest canopy. A specific geological history of the region resulted in the development of forest habitats on chalk outcrops or sandy sediments which are unique on a European scale (Fedorova 1980, Onyshchenko et al. 2007, Didukh and Pashkevich 2003).

Fungal diversity of eastern Ukraine remains insufficiently known. The first scanty documentation of fungal occurrences dates back to the beginning of 19th century (Akulov et al. 2003). The first inventory, specifically focused on the region, was completed four decades ago (Wasser and Soldatova 1977). Less than a decade ago, we reported the results of aphylophoroid fungi species inventories in several protected areas of eastern Ukraine (Ordynets and Akulov 2011, Ordynets and Akulov 2012, Ordynets et al. 2012, Ordynets et al. 2013). However, these were mostly species lists with sparse metadata, spread over several "floristic papers". This valuable information on fungal occurrences hardly meets the criteria of accessibility, reusability and sharing claimed for biodiversity data nowadays (Senderov and Penev 2016, Costello et al. 2013). Moreover, during the last four years, specimens collected by us were involved in a series of taxonomic studies and were re-identified. All the past and future identifications of the specimens represent valuable information which ideally should be easily updated and traced. Finally, the research area is affected by military activity for more than three years (Vasyliuk et al. 2015) and its preservation and accessibility for research in the forthcoming decades is questionable. Therefore, a proper preservation of the currently available data is required. In this data paper, we describe the effort of digitising and sharing the dataset of aphylophoroid fungi in selected areas of eastern Ukraine according to the current standards of publishing biodiversity information.

General description

Additional information: The project focuses on the diversity of aphylloroid fungi. These fungi form neither an evolutionary nor an ecological group but are often targeted as a research object because of both strong taxonomic tradition and sampling convenience. During most of the 20th century, fungi with macroscopic fruitbodies were taxonomically classified according to their fruitbody morphologies. Several generations of mycologists were trained using the morphological classification of fungi. Though these morphological groups barely represent monophyletic taxa and are usually the result of convergent evolution (Hibbett 2007), the present-day identification keys for macrofungi for practical reasons are still compiled based on the principal fruitbody type (e.g. Bernicchia and Gorjón 2010, Krieglsteiner and Kaiser 2000, Ryvarden and Melo 2014).

Aphylloroid fungi represent those basidial macrofungi which do not develop gills or closed reproductive structures but have smooth, toothed, irregularly folded to poroid hymenophore and one-celled basidia. They were previously treated as a single taxonomic order but are now found among ca. 20 orders mostly of the class Agaricomycetes (Kirk et al. 2008, Hibbett et al. 2014). Aphylloroid fungi are among the best-known groups of fungi globally and especially in Europe (Bernicchia and Gorjón 2010, Ryvarden and Melo 2014). They comprise a highly diverse group both in terms of species richness and functional differentiation. They are the most important agents of wood decay globally (Stokland et al. 2012), but also include mycorrhizal species, plant pathogens and litter saprotrophs (Tedersoo and Smith 2013). In general, aphylloroid fungi are strongly dependent on woody plants in terms of nutrition and habitat.

Project description

Study area description: Within the project, we inventoried aphylloroid fungi on 16 sampling areas located in eastern Ukraine and covering parts of three administrative regions, namely Kharkiv, Donetsk and Luhansk. All sampling areas are located in the middle basin of Siverskyi Donetsk River, Black Sea basin and their geomorphology developed due to the erosive activity of the river on the massive Upper Cretaceous sediments. We focused on the inventory of the well-preserved areas. We carried out the inventory in two Nature Reserves, i.e. the most strictly protected areas according to the Ukrainian conservational legislation (3 sampling areas), one National Nature Park (8 sampling areas) and one Regional Landscape Park (one sampling area). Four areas had no protected status but were located close to the protected ones. The list of areas with their definition, short characteristics including protection status, links to the areas as PlutoF objects and visiting/sampling statistics are provided in the Table 1. Beside the text description, each area was captured in photographs viewable on the respective area page in PlutoF (see web links in Table 1)

Table 1.

Definitions of 16 sampling areas in eastern Ukraine where aphylophoroid fungi were inventoried, with number of visits and taxa occurrences recorded.

Sampling area name	Locality text	Region	Commune	URL to the area in PlutoF*1	Number of visits to area	Number of specimens collected	Number of observations
Ukraine, Iziumska Luka floodplain	Iziumska Luka Regional Landscape Park, floodplain of the Siverskyi Donets River	Kharkiv	Balaklea	https://plutof.ut.ee/#/area/view/1782438	2	588	25
Ukraine, Iziumska Luka sandy terrace	Large sandy massif to the east from Iziumska Luka Regional Landscape Park	Kharkiv	Balaklea	https://plutof.ut.ee/#/area/view/1782428	2	78	11
Ukraine, Yaremivka	Area between Siverskyi Donets River and railway Izium-Sviatohirsk, between "Bukino" and "Studenok" train stations, including the candidate protected area Yaremivskyi Preserve	Kharkiv	Izium	https://plutof.ut.ee/#/area/view/1782489	2	74	43
Ukraine, Sviatohirsk floodplain	Sviati Hory National Nature Park, floodplain to the south of Sviatohirsk town	Donetsk	Sloviansk	https://plutof.ut.ee/#/area/view/1782490	7	127	39

Ukraine, Sviatohirsk hills	Sviati Hory National Nature Park, high steep hills south of the Syverskyi Donets River	Donetsk	Sloviansk	https:// plutof.ut.ee/#!/ area/ view/1782491	4	75	34
Ukraine, Sviatohirsk sandy terrace	Sviati Hory National Nature Park, pinery with inclusion of deciduous forest patches to the north and east of Sviatohirsk town	Donetsk	Lyman	https:// plutof.ut.ee/#!/ area/ view/1782495	8	610	206
Ukraine, Teplynske	Sviati Hory National Nature Park, west of Bogorodychne village	Donetsk	Sloviansk	https:// plutof.ut.ee/#!/ area/ view/1782493	5	115	149
Ukraine, Maiatske	Sviati Hory National Nature Park, west of Maiaki village	Donetsk	Sloviansk	https:// plutof.ut.ee/#!/ area/ view/1782494	2	85	5
Ukraine, Drobyshevsk	Sviati Hory National Nature Park, forest south-west of Drobyshevo village	Donetsk	Lyman	https:// plutof.ut.ee/#!/ area/ view/1782496	3	52	110
Ukraine, Lyman sandy terrace	Sviati Hory National Nature Park, sandy terrace south of Lyman town (before 2016 named Krasnyi Lyman)	Donetsk	Lyman	https:// plutof.ut.ee/#!/ area/ view/1782498	1	23	0

Ukraine, Lyman floodplain	Sviati Hory National Nature Park, floodplain south of Brusivka and Dibrova villages	Donetsk	Lyman	https:// plutof.ut.ee/#/ area/ view/1782499	1	6	0
Ukraine, Kreidova flora hills	Kreidova Flora, division of the Ukrainian Steppe Nature Reserve, vicinities of Kryva Luka village	Donetsk	Sloviansk	https:// plutof.ut.ee/#/ area/ view/1782500	1	220	0
Ukraine, Kreidova flora floodplain	Floodplain of the Syverskyi Donets River near Kryva Luka village	Donetsk	Sloviansk	https:// plutof.ut.ee/#/ area/ view/1782501	1	101	0
Ukraine, Trokhizbenka sandy terrace	Trokhizbenskyi Step division of the Luhansk Nature Reserve, north of Trokhizbenka and Kriakivka villages	Luhansk	Slovianoserbsk	https:// plutof.ut.ee/#/ area/ view/1782503	1	136	52
Ukraine, Trokhizbenka floodplain	Floodplain of Syverskyi Donets River south of Trokhizbenka and Kriakivka villages	Luhansk	Slovianoserbsk	https:// plutof.ut.ee/#/ area/ view/1782505	1	11	17
Ukraine, Stanychno- Luhanske	Stanychno- Luhanske division of the Luhansk Nature Reserve, east of Stanytsia Luhanska town	Luhansk	Stanytsia Luhanska	https:// plutof.ut.ee/#/ area/ view/1782502	1	426	0

The sampling areas lie in the East European Plain. The elevation varies between 35 and 220 m a.s.l. The Upper Cretaceous sediments (of a chalk and marl) form a series of hills along the right bank of the Siverskyi Donets River, often with outcroppings. Quaternary sediments were formed mostly on the left bank of the river as alluvial and massive sandy accumulations (Bondarchuk 1959). The soils vary according to the bedrock characteristics. On the products of eolation, the ordinary chernozems with medium humus contents were formed. Slopes of the river valley and ravines are covered with the leached sod-calcareous soils. The river floodplain is dominated by meadow chernozems. Alluvial sand accumulations of the second river terrace bear sod-podzolic soils (Didukh and Pashkevich 2003).

According to the Köppen climate classification, the region falls into the area of a cold forest climate with severe winters and dry, long and hot summers (Jylhä et al. 2010). Compared to the rest of Ukraine, here the climate has the most pronounced continental characteristics. The mean annual temperature is 7.5°C, with recorded minimum of -40°C (January) and maximum of 39°C (July). The average annual precipitation is 400–540 mm, while the evaporation is 580–650 mm. Up to 60 days per year with very strong hot dry winds are possible (Popov et al. 1968).

According to the classification of terrestrial ecoregions of the world, the study area belongs to the biome of temperate grasslands, savannahs and shrublands (Olson et al. 2001). It is also known as a steppe region (EEA 2015). In these conditions, the natural woody vegetation mostly represents forest patches of limited size. The few striking exceptions exist due to their proximity to the large Siverskyi Donets River, as well as hilly landscape. Two broadleaf forests (called Teplynska dacha and Maiatska dacha) are the largest forest massifs on the watershed in the Ukrainian steppe zone (Onyshchenko et al. 2007).

The pedunculate oak *Quercus robur* L. is one of the most important tree species in the area. In the forests on the watershed, this oak species is accompanied by *Fraxinus excelsior* L., *Tilia cordata* Mill., *Acer platanoides* L., *A. campestre* L., *A. tataricum* L. and *Corylus avellana* L. In the Siverskyi Donets floodplain, the oak forest grows mosaically with the forests composed of *Alnus glutinosa* (L.) Gaertn., various poplars (*Populus nigra* L., *P. alba* L. and *P. tremula* L.), willows (*Salix alba* L., *Salix fragilis* L.) and *Acer negundo* L. (Popovych 1990).

The massive sandy terrace of the Siverskyi Donets River is basically a habitat for the psammophytic grasses and herbs. However, there are numerous depressions which provide a suitable microclimate for the development of the wetland local forests (groves). The usual trees in these habitats are: *Betula pendula* Roth, *B. pubescens* Ehrh., *Populus tremula*, *P. nigra* and *P. alba*, *Alnus glutinosa* and *Crataegus* spp. The willow shrubby communities of *Salix acutifolia* Willd. and *Salix rosmarinifolia* L. are common in some localities (Popovych 1990). As a result of land-use in the 19th and 20th centuries, large areas of the sandy terrace are currently covered not by primary vegetation of psammophytic grasses and herbs, but by plantations of *Pinus sylvestris* L. However, some of these stands are about 200 years old and resemble natural forests. The true natural pine forests in the region are currently confined to the chalky outcrops with the sod-calcareous

soils. These populations were treated in the past decades as a relict species *Pinus cretacea* Kalen. (Didukh and Pashkevich 2003, Fedorova 1980) currently regarded as a variety of Scots pine, *P. sylvestris* var. *cretacea* (Kalen.) Kom. (Gardner 2013).

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Sampling methods

Sampling description: In 16 areas, we sampled living fungal fruitbodies according to the standards for macrofungi collecting (Lodge et al. 2004). We were interested in recording the majority of species from the local species pool. Therefore we sampled not within fixed areas, but covered larger areas by sampling along the forest paths. We were passing up to ten kilometres of forest paths per day. We spent more time at the points which visually harboured higher amounts and diversity of deadwood. Visiting and sampling statistics for each area are provided in Table 1.

If the species could be readily identified in the field, the occurrence was recorded without taking a specimen, i.e. as observation, except for the very first finding of the species during the field work. All fruiting bodies from a single woody substrate or growing in a single cluster on debris or litter were treated as a single individual. For the records on woody substrata (which prevail in the dataset), principal tree fraction, diameter class, decay stage, spatial location and presence/absence of the direct contact with soil were recorded. For all the records, plant species of the substrate as well as characteristics of forest habitat and mesorelief were described (Table 2). All collected data were uploaded and managed on the PlutoF platform (Abarenkov et al. 2010).

Table 2.

Substrate and habitat characteristics of fungal occurrence data recorded in the project.

Variable attribution	Variable	Number of categories	States of the variable	Reference
Substrate: all records	Plant species	56		
Substrate: records from wood	Principal tree fraction	3	branch; stump; trunk	Safonov 2003
	Diameter class	4	1 (<3 cm); 2 (3–10 cm); 3 (10–20 cm); 4 (>20 cm), according to measurement at the base of woody unit	Safonov 2003
	Wood decay stage	5	1–5 according to the depth of knife penetration into the wood, bark cover, preservation of initial circumference	Heilmann-Clausen and Christensen 2003, Renvall 1995
	Spatial location of substrate	3	attached (including suspended); fallen; standing (including snags and stumps)	This project
	Direct contact with soil	2	in contact with soil; no contact with soil	This project
Habitat	Forest spread type	5	continuous; focal in steppe; focal surrounded by artificial pine forest; sparse; windbreaks	This project
	Forest type, according to dominating tree species	6	alder, birch, oak, pinery, poplar, willow	This project
	Mesorelief type	6	floodplain, ravine, sands depression, sands rising, steep river bank, watershed	Belgard 1971

Quality control: One of the challenges in inventorying fungal diversity based on fruiting bodies is the temporal irregularity of fruiting. To reduce the bias associated with this phenomenon, within five years (2007–2011), we carried out 15 expeditions, usually making one expedition per season (spring, summer and autumn). The earliest and latest sampling dates were March 9 and November 22 respectively. Each expedition lasted as a minimum three and as a maximum seven days. Within a single expedition, we visited up to four sampling areas (see Table 1). Some areas could be visited only once. This may be

acceptable in the case of aphyllorhoid fungi which, as opposed to other fruiting fungi, in general create more lasting fruitbodies.

Along with the specimens which were more or less easily identified, there were also collections whose identifications were verified by another expert or collections which we could identify to the genus level only. Wolfgang Dămon, Ivan Zmitrovich, Anton Shyriaev, Heikki Kotiranta, Masoomeh Ghobad-Nejhad, Philomena Bodensteiner, Sergey Volobuev, Viacheslav Spirin and Erast Parmasto kindly helped us in such issues. The names of the experts who verified or improved our identifications are provided in the pane "Identifications", fields "Identifiers" and/or "Remarks" on the respective specimen page as viewed in PlutoF. Additionally, each PlutoF observation linked to our dataset was verified by the platform developer as seen in the pane "Discussion" on the single observation page.

Step description: Noticeable specimens were photographed directly in the field or after drying in the laboratory. The micromorphology study of the dried specimens was performed under 1000× magnification using light microscopes Zeiss Primo Star (Carl Zeiss Jena GmbH, Jena, Germany) and Nikon Eclipse 90i (Nikon Corp., Tokyo, Japan). The specimens were examined in 5% aqueous potassium hydroxide solution, Melzer's reagent and 1% Congo red solution in concentrated ammonia (Ryvarden and Melo 2014). The main identification keys used were Bernicchia and Gorjón (2010), Kõljalg (1996), Larsson (1992), Ryvarden and Melo (2014).

Geographic coverage

Description: The extent of all sampling areas covers about 180 km in the longitudinal and 60 km in latitudinal direction. The total area of study is 380 km².

Coordinates: 48.7175° and 49.29° Latitude; 36.91884° and 39.39385° Longitude.

Taxonomic coverage

Description: The dataset contains 3418 species occurrences. It has 2727 specimens and 691 observation records, containing 349 species of fungi from the phylum *Basidiomycota*. Additional 16 items have no specific epithet but only genus-level (in one case order-level) identification (Table 3).

Table 3.

Species checklist and frequencies of occurrence of aphylloporoid fungi (phylum *Basidiomycota*) from insular woodlands of eastern Ukraine. Specific epithet is available for 349 taxa, while it could not be found for 16 items (only genus-level or order-level identification was possible)

Taxon name	Count specimens	Count observations	Class	Order	Family	Genus
<i>Abortiporus biennis</i>	1		Agaricomycetes	Polyporales	Podoscyphaceae	<i>Abortiporus</i>
<i>Aleurodiscus dextrinoideo-cerussatus</i>	2		Agaricomycetes	Russulales	Stereaceae	<i>Aleurodiscus</i>
<i>Amphinema byssoides</i>	6		Agaricomycetes	Atheliales	Atheliaceae	<i>Amphinema</i>
<i>Amyloenasma allantosporum</i>	1		Agaricomycetes	Amylocorticiales	Amylocorticiaceae	<i>Amyloenasma</i>
<i>Antrrodia albida</i>	2		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Antrrodia</i>
<i>Antrrodia gossypium</i>	9		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Antrrodia</i>
<i>Antrrodia hyalina</i>	13		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Antrrodia</i>
<i>Antrrodia malicola</i>	24	4	Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Antrrodia</i>
<i>Antrrodia ramentacea</i>	4		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Antrrodia</i>
<i>Antrrodia sinuosa</i>	1		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Antrrodia</i>
<i>Antrrodia</i> sp.	1		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Antrrodia</i>
<i>Antrrodia xantha</i>	2		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Antrrodia</i>
<i>Antrrodiella faginea</i>	2		Agaricomycetes	Polyporales	Steccherinaceae	<i>Antrrodiella</i>
<i>Antrrodiella ichnusana</i>	1		Agaricomycetes	Polyporales	Steccherinaceae	<i>Antrrodiella</i>
<i>Antrrodiella romellii</i>	1		Agaricomycetes	Polyporales	Steccherinaceae	<i>Antrrodiella</i>
<i>Aphanobasidium pseudotsugae</i>	2		Agaricomycetes	Agaricales	Pterulaceae	<i>Aphanobasidium</i>
<i>Aporpium canescens</i>	10		Agaricomycetes	Auriculariales	Auriculariales fam incertae sedis	<i>Aporpium</i>
<i>Artomyces pyxidatus</i>	5	5	Agaricomycetes	Russulales	Auriscalpiaceae	<i>Artomyces</i>

<i>Athelia acrospora</i>	2		Agaricomycetes	Atheliales	Atheliaceae	<i>Athelia</i>
<i>Athelia arachnoidea</i>	33	3	Agaricomycetes	Atheliales	Atheliaceae	<i>Athelia</i>
<i>Athelia bombacina</i>	2		Agaricomycetes	Atheliales	Atheliaceae	<i>Athelia</i>
<i>Athelia decipiens</i>	14		Agaricomycetes	Atheliales	Atheliaceae	<i>Athelia</i>
<i>Athelia epiphylla</i>	26		Agaricomycetes	Atheliales	Atheliaceae	<i>Athelia</i>
<i>Athelia fibulata</i>	3		Agaricomycetes	Atheliales	Atheliaceae	<i>Athelia</i>
<i>Athelia salicum</i>	2		Agaricomycetes	Atheliales	Atheliaceae	<i>Athelia</i>
<i>Athelia</i> sp.	11		Agaricomycetes	Atheliales	Atheliaceae	<i>Athelia</i>
<i>Aurantiporus fissilis</i>	2	1	Agaricomycetes	Polyporales	Meruliaceae	<i>Aurantiporus</i>
<i>Auriscalpium vulgare</i>	3	7	Agaricomycetes	Russulales	Auriscalpiaceae	<i>Auriscalpium</i>
<i>Basidiodendron caesiocinereum</i>	1		Agaricomycetes	Auriculariales	Exidiaceae	<i>Basidiodendron</i>
<i>Basidiodendron deminutum</i>	2		Agaricomycetes	Auriculariales	Exidiaceae	<i>Basidiodendron</i>
<i>Basidiodendron eyrei</i>	8		Agaricomycetes	Auriculariales	Exidiaceae	<i>Basidiodendron</i>
<i>Basidioradulum tuberculatum</i>	1		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Basidioradulum</i>
<i>Bjerkandera adusta</i>	19	14	Agaricomycetes	Polyporales	Meruliaceae	<i>Bjerkandera</i>
<i>Bjerkandera fumosa</i>	2	1	Agaricomycetes	Polyporales	Meruliaceae	<i>Bjerkandera</i>
<i>Boidinia furfuracea</i>	1		Agaricomycetes	Russulales	Russulales fam incertae sedis	<i>Boidinia</i>
<i>Botryobasidium arachnoideum</i>	1		Agaricomycetes	Cantharellales	Botryobasidiaceae	<i>Botryobasidium</i>
<i>Botryobasidium aureum</i>	2		Agaricomycetes	Cantharellales	Botryobasidiaceae	<i>Botryobasidium</i>
<i>Botryobasidium candicans</i>	22		Agaricomycetes	Cantharellales	Botryobasidiaceae	<i>Botryobasidium</i>
<i>Botryobasidium conspersum</i>	34		Agaricomycetes	Cantharellales	Botryobasidiaceae	<i>Botryobasidium</i>
<i>Botryobasidium curtisii</i>	3		Agaricomycetes	Cantharellales	Botryobasidiaceae	<i>Botryobasidium</i>

<i>Botryobasidium laeve</i>	12		Agaricomycetes	Cantharellales	Botryobasidiaceae	<i>Botryobasidium</i>
<i>Botryobasidium pruinatum</i>	10		Agaricomycetes	Cantharellales	Botryobasidiaceae	<i>Botryobasidium</i>
<i>Botryobasidium robustius</i>	8		Agaricomycetes	Cantharellales	Botryobasidiaceae	<i>Botryobasidium</i>
<i>Botryobasidium simile</i>	1		Agaricomycetes	Cantharellales	Botryobasidiaceae	<i>Botryobasidium</i>
<i>Botryobasidium sphaericosporum</i>	8		Agaricomycetes	Cantharellales	Botryobasidiaceae	<i>Botryobasidium</i>
<i>Botryobasidium subcoronatum</i>	46		Agaricomycetes	Cantharellales	Botryobasidiaceae	<i>Botryobasidium</i>
<i>Botryohypochnus isabellinus</i>	7		Agaricomycetes	Cantharellales	Botryobasidiaceae	<i>Botryohypochnus</i>
<i>Bourdotia galzinii</i>	1		Agaricomycetes	Auriculariales	Auriculariales incertae sedis	<i>Bourdotia</i>
<i>Brevicellicium olivascens</i>	1		Agaricomycetes	Trechisporales	Hydnodontaceae	<i>Brevicellicium</i>
<i>Bulbillomyces farinosus</i>	8		Agaricomycetes	Polyporales	Podoscyphaceae	<i>Bulbillomyces</i>
<i>Byssomerulius corium</i>	23	10	Agaricomycetes	Polyporales	Meruliaceae	<i>Byssomerulius</i>
<i>Ceraceomyces serpens</i>	12		Agaricomycetes	Polyporales	Meruliaceae	<i>Ceraceomyces</i>
<i>Ceraceomyces tessulatus</i>	3		Agaricomycetes	Polyporales	Meruliaceae	<i>Ceraceomyces</i>
<i>Ceratobasidium cornigerum</i>	10		Agaricomycetes	Cantharellales	Ceratobasidiaceae	<i>Ceratobasidium</i>
<i>Ceriporia purpurea</i>	19	1	Agaricomycetes	Polyporales	Meruliaceae	<i>Ceriporia</i>
<i>Ceriporia reticulata</i>	1		Agaricomycetes	Polyporales	Meruliaceae	<i>Ceriporia</i>
<i>Ceriporia viridans</i>	4		Agaricomycetes	Polyporales	Meruliaceae	<i>Ceriporia</i>
<i>Ceriporiopsis mucida</i>	1		Agaricomycetes	Polyporales	Steccherinaceae	<i>Ceriporiopsis</i>
<i>Ceriporiopsis resinascens</i>	3		Agaricomycetes	Polyporales	Steccherinaceae	<i>Ceriporiopsis</i>
<i>Cerrena unicolor</i>	8	3	Agaricomycetes	Polyporales	Cerrenaceae	<i>Cerrena</i>

<i>Chondrostereum purpureum</i>	10	13	Agaricomycetes	Agaricales	Agaricales fam incertae sedis	<i>Chondrostereum</i>
<i>Colacogloea peniophorae</i>	3		Microbotryomycetes	Microbotryomycetes ord incertae sedis	Microbotryomycetes fam incertae sedis	<i>Colacogloea</i>
<i>Coltricia perennis</i>	1	1	Agaricomycetes	Hymenochaetales	Hymenochaetales	<i>Coltricia</i>
<i>Coniophora arida</i>	36	3	Agaricomycetes	Boletales	Coniophoraceae	<i>Coniophora</i>
<i>Coniophora fusispora</i>	4		Agaricomycetes	Boletales	Coniophoraceae	<i>Coniophora</i>
<i>Coniophora olivacea</i>	13		Agaricomycetes	Boletales	Coniophoraceae	<i>Coniophora</i>
<i>Coniophora puteana</i>	31	3	Agaricomycetes	Boletales	Coniophoraceae	<i>Coniophora</i>
<i>Coniophora</i> sp.	1		Agaricomycetes	Boletales	Coniophoraceae	<i>Coniophora</i>
<i>Corioloopsis gallica</i>	3		Agaricomycetes	Polyporales	Polyporaceae	<i>Corioloopsis</i>
<i>Corticium roseum</i>	10		Agaricomycetes	Corticiales	Corticaceae	<i>Corticium</i>
<i>Cristinia helvetica</i>	1		Agaricomycetes	Agaricales	Stephanosporaceae	<i>Cristinia</i>
<i>Cristinia rhenana</i>	24		Agaricomycetes	Agaricales	Stephanosporaceae	<i>Cristinia</i>
<i>Cylindrobasidium evolvens</i>	7		Agaricomycetes	Agaricales	Physalacriaceae	<i>Cylindrobasidium</i>
<i>Dacryobolus sudans</i>	3		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Dacryobolus</i>
<i>Daedalea quercina</i>	4	8	Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Daedalea</i>
<i>Daedaleopsis confragosa</i>	3	4	Agaricomycetes	Polyporales	Polyporaceae	<i>Daedaleopsis</i>
<i>Datronia mollis</i>	1		Agaricomycetes	Polyporales	Polyporaceae	<i>Datronia</i>
<i>Dendrothele acerina</i>	10	8	Agaricomycetes	Agaricomycetes ord incertae sedis	Agaricomycetes fam incertae sedis	<i>Dendrothele</i>
<i>Dendrothele alliacea</i>	15	4	Agaricomycetes	Agaricomycetes ord incertae sedis	Agaricomycetes fam incertae sedis	<i>Dendrothele</i>
<i>Dendrothele minutissima</i>	1		Agaricomycetes	Agaricomycetes ord incertae sedis	Agaricomycetes fam incertae sedis	<i>Dendrothele</i>
<i>Dichomitus campestris</i>	7	4	Agaricomycetes	Polyporales	Polyporaceae	<i>Dichomitus</i>
<i>Dichomitus squalens</i>	16	1	Agaricomycetes	Polyporales	Polyporaceae	<i>Dichomitus</i>

<i>Dichostereum effusatum</i>	1		Agaricomycetes	Russulales	Lachnocladiaceae	<i>Dichostereum</i>
<i>Diplomitoporus flavescens</i>	6		Agaricomycetes	Polyporales	Meripilaceae	<i>Diplomitoporus</i>
<i>Erythricium hypnophilum</i>	2		Agaricomycetes	Corticiales	Corticaceae	<i>Erythricium</i>
<i>Exidiopsis galzinii</i>	1		Agaricomycetes	Auriculariales	Exidiaceae	<i>Exidiopsis</i>
<i>Exidiopsis griseobrunnea</i>	1		Agaricomycetes	Auriculariales	Exidiaceae	<i>Exidiopsis</i>
<i>Fibriciellum silvae-ryae</i>	1		Agaricomycetes	Trechisporales	Hydnodontaceae	<i>Fibriciellum</i>
<i>Fibricium subceraceum</i>	3		Agaricomycetes	Polyporales	Steccherinaceae	<i>Fibricium</i>
<i>Fibrodontia gossypina</i>	2		Agaricomycetes	Trechisporales	Hydnodontaceae	<i>Fibrodontia</i>
<i>Fibroporia vaillantii</i>	1		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Fibroporia</i>
<i>Fibulomyces fusoides</i>	6		Agaricomycetes	Atheliales	Atheliaceae	<i>Fibulomyces</i>
<i>Fibulomyces mutabilis</i>	5		Agaricomycetes	Atheliales	Atheliaceae	<i>Fibulomyces</i>
<i>Fibulomyces</i> sp.	2		Agaricomycetes	Atheliales	Atheliaceae	<i>Fibulomyces</i>
<i>Fistulina hepatica</i>	3	2	Agaricomycetes	Agaricales	Fistulinaceae	<i>Fistulina</i>
<i>Fomes fomentarius</i>	4	81	Agaricomycetes	Polyporales	Polyporaceae	<i>Fomes</i>
<i>Fomitiporia punctata</i>	9	7	Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Fomitiporia</i>
<i>Fomitiporia robusta</i>	3	14	Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Fomitiporia</i>
<i>Fuscoporia contigua</i>	25	2	Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Fuscoporia</i>
<i>Fuscoporia ferruginosa</i>	47	3	Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Fuscoporia</i>
<i>Galzinia incrustans</i>	3		Agaricomycetes	Corticiales	Corticaceae	<i>Galzinia</i>
<i>Ganoderma applanatum</i>	7	14	Agaricomycetes	Polyporales	Ganodermataceae	<i>Ganoderma</i>
<i>Ganoderma lucidum</i>	1		Agaricomycetes	Polyporales	Ganodermataceae	<i>Ganoderma</i>

<i>Ganoderma resinaceum</i>	4		Agaricomycetes	Polyporales	Ganodermataceae	<i>Ganoderma</i>
<i>Gloeocystidiellum porosum</i>	3		Agaricomycetes	Russulales	Gloeocystidiellaceae	<i>Gloeocystidiellum</i>
<i>Gloeohyphochnium analogum</i>	1		Agaricomycetes	Amylocorticiales	Amylocorticiaceae	<i>Gloeohyphochnium</i>
<i>Gloeophyllum sepiarium</i>	2		Agaricomycetes	Gloeophyllales	Gloeophyllaceae	<i>Gloeophyllum</i>
<i>Gloeophyllum trabeum</i>	3		Agaricomycetes	Gloeophyllales	Gloeophyllaceae	<i>Gloeophyllum</i>
<i>Gloeoporus dichrous</i>	15	17	Agaricomycetes	Polyporales	Meruliaceae	<i>Gloeoporus</i>
<i>Gloeoporus pannocinctus</i>	12	2	Agaricomycetes	Polyporales	Meruliaceae	<i>Gloeoporus</i>
<i>Gloeoporus taxicola</i>	2	1	Agaricomycetes	Polyporales	Meruliaceae	<i>Gloeoporus</i>
<i>Gloiothele lactescens</i>	8		Agaricomycetes	Russulales	Lachnocladiaceae	<i>Gloiothele</i>
<i>Granulobasidium vellereum</i>	14		Agaricomycetes	Agaricomycetes ord incertae sedis	Agaricomycetes fam incertae sedis	<i>Granulobasidium</i>
<i>Hapalopilus nidulans</i>	6	1	Agaricomycetes	Polyporales	Meruliaceae	<i>Hapalopilus</i>
<i>Helicogloea farinacea</i>	1		Atractiellomycetes	Atractiellales	Atractiellales fam incertae sedis	<i>Helicogloea</i>
<i>Helicogloea lagerheimii</i>	2		Atractiellomycetes	Atractiellales	Atractiellales fam incertae sedis	<i>Helicogloea</i>
<i>Henningsomyces candidus</i>	7		Agaricomycetes	Agaricales	Cyphellaceae	<i>Henningsomyces</i>
<i>Henningsomyces stipitatus</i>	1		Agaricomycetes	Agaricales	Cyphellaceae	<i>Henningsomyces</i>
<i>Heridium coralloides</i>	2		Agaricomycetes	Russulales	Hericiaceae	<i>Heridium</i>
<i>Heterobasidion annosum</i>	1		Agaricomycetes	Russulales	Bondarzewiaceae	<i>Heterobasidion</i>
<i>Heteroradulum kmetii</i>	7		Agaricomycetes	Auriculariales	Exidiaceae	<i>Heteroradulum</i>

<i>Hydnocristella himantia</i>	4		Agaricomycetes	Gomphales	Lentariaceae	<i>Hydnocristella</i>
<i>Hymenochaete cinnamomea</i>	23	5	Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Hymenochaete</i>
<i>Hymenochaete fuliginosa</i>	9		Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Hymenochaete</i>
<i>Hymenochaete rubiginosa</i>	11	32	Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Hymenochaete</i>
<i>Hyphoderma argillaceum</i>	1		Agaricomycetes	Polyporales	Hyphodermataceae	<i>Hyphoderma</i>
<i>Hyphoderma griseoflavescens</i>	1		Agaricomycetes	Polyporales	Hyphodermataceae	<i>Hyphoderma</i>
<i>Hyphoderma mutatum</i>	14		Agaricomycetes	Polyporales	Hyphodermataceae	<i>Hyphoderma</i>
<i>Hyphoderma setigerum</i>	44		Agaricomycetes	Polyporales	Hyphodermataceae	<i>Hyphoderma</i>
<i>Hyphoderma</i> sp.	1		Agaricomycetes	Polyporales	Hyphodermataceae	<i>Hyphoderma</i>
<i>Hyphoderma transiens</i>	2		Agaricomycetes	Polyporales	Hyphodermataceae	<i>Hyphoderma</i>
<i>Hyphodontia arguta</i>	15		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Hyphodontia</i>
<i>Hyphodontia aspera</i>	1		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Hyphodontia</i>
<i>Hyphodontia breviseta</i>	5		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Hyphodontia</i>
<i>Hyphodontia crustosa</i>	76		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Hyphodontia</i>
<i>Hyphodontia erastii</i>	1		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Hyphodontia</i>
<i>Hyphodontia incrustata</i>	1		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Hyphodontia</i>
<i>Hyphodontia microspora</i>	2		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Hyphodontia</i>
<i>Hyphodontia nespori</i>	4		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Hyphodontia</i>
<i>Hyphodontia pallidula</i>	12		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Hyphodontia</i>
<i>Hyphodontia pruni</i>	2		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Hyphodontia</i>

<i>Hyphodontia quercina</i>	2		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Hyphodontia</i>
<i>Hyphodontia radula</i>	17		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Hyphodontia</i>
<i>Hyphodontia sambuci</i>	33		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Hyphodontia</i>
<i>Hyphodontia</i> sp.	7		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Hyphodontia</i>
<i>Hyphodontia spathulata</i>	5		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Hyphodontia</i>
<i>Hyphodontia subalutacea</i>	4		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Hyphodontia</i>
<i>Hyphodontia tuberculata</i>	1		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Hyphodontia</i>
<i>Hyphodontia verruculosa</i>	1		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Hyphodontia</i>
<i>Hypochniciellum ovoideum</i>	1		Agaricomycetes	Amylocorticiales	Amylocorticiaceae	<i>Hypochniciellum</i>
<i>Hypochnicium geogenium</i>	3		Agaricomycetes	Polyporales	Podoscyphaceae	<i>Hypochnicium</i>
<i>Hypochnicium wakefieldiae</i>	10		Agaricomycetes	Polyporales	Podoscyphaceae	<i>Hypochnicium</i>
<i>Inonotus cuticularis</i>	1		Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Inonotus</i>
<i>Inonotus hispidus</i>	4		Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Inonotus</i>
<i>Inonotus lonicerinus</i>	2		Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Inonotus</i>
<i>Inonotus obliquus</i>	3	3	Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Inonotus</i>
<i>Inonotus rheades</i>	4	3	Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Inonotus</i>
<i>Irpex lacteus</i>	25	15	Agaricomycetes	Polyporales	Meruliaceae	<i>Irpex</i>
<i>Junghuhnia nitida</i>	5	1	Agaricomycetes	Polyporales	Steccherinaceae	<i>Junghuhnia</i>
<i>Lachnella albviolascens</i>	1		Agaricomycetes	Agaricales	Tricholomataceae	<i>Lachnella</i>
<i>Lachnella</i> sp.	4		Agaricomycetes	Agaricales	Tricholomataceae	<i>Lachnella</i>
<i>Laetiporus sulphureus</i>	3	11	Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Laetiporus</i>
<i>Lagarobasidium detriticum</i>	1		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Lagarobasidium</i>

<i>Laxitextum bicolor</i>	2		Agaricomycetes	Russulales	Gloeocystidiellaceae	<i>Laxitextum</i>
<i>Lentaria patouillardii</i>	3		Agaricomycetes	Gomphales	Lentariaceae	<i>Lentaria</i>
<i>Lenzites betulina</i>	1		Agaricomycetes	Polyporales	Coriolaceae	<i>Lenzites</i>
<i>Lenzites warnieri</i>	7	4	Agaricomycetes	Polyporales	Coriolaceae	<i>Lenzites</i>
<i>Leptosporomyces galzinii</i>	1		Agaricomycetes	Atheliales	Atheliaceae	<i>Leptosporomyces</i>
<i>Leptosporomyces mundus</i>	1		Agaricomycetes	Atheliales	Atheliaceae	<i>Leptosporomyces</i>
<i>Leucogyrophana mollusca</i>	12		Agaricomycetes	Boletales	Boletales fam incertae sedis	<i>Leucogyrophana</i>
<i>Leucogyrophana pinastrii</i>	1		Agaricomycetes	Boletales	Boletales fam incertae sedis	<i>Leucogyrophana</i>
<i>Loweomyces fractipes</i>	2		Agaricomycetes	Polyporales	Steccherinaceae	<i>Loweomyces</i>
<i>Macrotyphula fistulosa</i>	4	4	Agaricomycetes	Agaricales	Typhulaceae	<i>Macrotyphula</i>
<i>Macrotyphula juncea</i>	10		Agaricomycetes	Agaricales	Typhulaceae	<i>Macrotyphula</i>
<i>Maireina maxima</i>	2		Agaricomycetes	Agaricales	Niaceae	<i>Maireina</i>
<i>Mensularia radiata</i>	18	6	Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Mensularia</i>
<i>Merismodes fasciculata</i>	5		Agaricomycetes	Agaricales	Tricholomataceae	<i>Merismodes</i>
<i>Merulius tremellosus</i>	26	18	Agaricomycetes	Polyporales	Meruliaceae	<i>Merulius</i>
<i>Metulodontia nivea</i>	1		Agaricomycetes	Russulales	Peniophoraceae	<i>Metulodontia</i>
<i>Mucronella calva</i>	4		Agaricomycetes	Agaricales	Clavariaceae	<i>Mucronella</i>
<i>Mucronella flava</i>	1		Agaricomycetes	Agaricales	Clavariaceae	<i>Mucronella</i>
<i>Mycoacia columellifera</i>	1		Agaricomycetes	Polyporales	Meruliaceae	<i>Mycoacia</i>
<i>Mycoacia fuscoatra</i>	2		Agaricomycetes	Polyporales	Meruliaceae	<i>Mycoacia</i>
<i>Mycoacia uda</i>	7		Agaricomycetes	Polyporales	Meruliaceae	<i>Mycoacia</i>
<i>Mycoaciella bispora</i>	4		Agaricomycetes	Polyporales	Meruliaceae	<i>Mycoaciella</i>
<i>Odontia ferruginea</i>	1		Agaricomycetes	<i>Thelephorales</i>	Thelephoraceae	<i>Odontia</i>

<i>Odontia fibrosa</i>	1		Agaricomycetes	<i>Thelephorales</i>	Thelephoraceae	<i>Odontia</i>
<i>Oxyporus corticola</i>	21	3	Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Oxyporus</i>
<i>Oxyporus latemarginatus</i>	10		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Oxyporus</i>
<i>Oxyporus obducens</i>	5	1	Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Oxyporus</i>
<i>Oxyporus similis</i>	1		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Oxyporus</i>
<i>Oxyporus</i> sp.	1		Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Oxyporus</i>
<i>Paulliticium pearsonii</i>	1		Agaricomycetes	Polyporales	Polyporales fam incertae sedis	<i>Paulliticium</i>
<i>Peniophora cinerea</i>	34		Agaricomycetes	Russulales	Peniophoraceae	<i>Peniophora</i>
<i>Peniophora erikssonii</i>	5		Agaricomycetes	Russulales	Peniophoraceae	<i>Peniophora</i>
<i>Peniophora incarnata</i>	5		Agaricomycetes	Russulales	Peniophoraceae	<i>Peniophora</i>
<i>Peniophora laeta</i>	2		Agaricomycetes	Russulales	Peniophoraceae	<i>Peniophora</i>
<i>Peniophora lilacea</i>	20		Agaricomycetes	Russulales	Peniophoraceae	<i>Peniophora</i>
<i>Peniophora limitata</i>	16	4	Agaricomycetes	Russulales	Peniophoraceae	<i>Peniophora</i>
<i>Peniophora lycii</i>	10		Agaricomycetes	Russulales	Peniophoraceae	<i>Peniophora</i>
<i>Peniophora nuda</i>	30	1	Agaricomycetes	Russulales	Peniophoraceae	<i>Peniophora</i>
<i>Peniophora pini</i>	2		Agaricomycetes	Russulales	Peniophoraceae	<i>Peniophora</i>
<i>Peniophora polygonia</i>	3	2	Agaricomycetes	Russulales	Peniophoraceae	<i>Peniophora</i>
<i>Peniophora quercina</i>	19	25	Agaricomycetes	Russulales	Peniophoraceae	<i>Peniophora</i>
<i>Peniophora rufomarginata</i>	11	13	Agaricomycetes	Russulales	Peniophoraceae	<i>Peniophora</i>
<i>Peniophora violaceolivida</i>	4		Agaricomycetes	Russulales	Peniophoraceae	<i>Peniophora</i>
<i>Peniophorella pallida</i>	8		Agaricomycetes	Hymenochaetales	Hymenochaetales fam incertae sedis	<i>Peniophorella</i>
<i>Peniophorella praetermissa</i>	44		Agaricomycetes	Hymenochaetales	Hymenochaetales fam incertae sedis	<i>Peniophorella</i>
<i>Peniophorella pubera</i>	43		Agaricomycetes	Hymenochaetales	Hymenochaetales fam incertae sedis	<i>Peniophorella</i>

<i>Peniophorella tsugae</i>	1		Agaricomycetes	Hymenochaetales	Hymenochaetales fam incertae sedis	<i>Peniophorella</i>
<i>Perenniporia narymica</i>	1		Agaricomycetes	Polyporales	Ganodermataceae	<i>Perenniporia</i>
<i>Phaeolus schweinitzii</i>	2		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Phaeolus</i>
<i>Phanerochaete cumulodentata</i>	5		Agaricomycetes	Polyporales	Meruliaceae	<i>Phanerochaete</i>
<i>Phanerochaete deflectens</i>	1		Agaricomycetes	Polyporales	Meruliaceae	<i>Phanerochaete</i>
<i>Phanerochaete jose-ferreirae</i>	2		Agaricomycetes	Polyporales	Meruliaceae	<i>Phanerochaete</i>
<i>Phanerochaete livescens</i>	3		Agaricomycetes	Polyporales	Meruliaceae	<i>Phanerochaete</i>
<i>Phanerochaete sanguinea</i>	1		Agaricomycetes	Polyporales	Meruliaceae	<i>Phanerochaete</i>
<i>Phanerochaete sordida</i>	21		Agaricomycetes	Polyporales	Meruliaceae	<i>Phanerochaete</i>
<i>Phanerochaete</i> sp.	1		Agaricomycetes	Polyporales	Meruliaceae	<i>Phanerochaete</i>
<i>Phanerochaete tuberculata</i>	16		Agaricomycetes	Polyporales	Meruliaceae	<i>Phanerochaete</i>
<i>Phanerochaete velutina</i>	9		Agaricomycetes	Polyporales	Meruliaceae	<i>Phanerochaete</i>
<i>Phellinus igniarius</i>	8	14	Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Phellinus</i>
<i>Phellinus pomaceus</i>	4	2	Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Phellinus</i>
<i>Phellinus populicola</i>	2		Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Phellinus</i>
<i>Phellinus rhamnii</i>	6		Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Phellinus</i>
<i>Phellinus tremulae</i>	5		Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Phellinus</i>
<i>Phlebia acerina</i>	7	1	Agaricomycetes	Polyporales	Meruliaceae	<i>Phlebia</i>
<i>Phlebia albida</i>	1		Agaricomycetes	Polyporales	Meruliaceae	<i>Phlebia</i>
<i>Phlebia bresadolae</i>	1		Agaricomycetes	Polyporales	Meruliaceae	<i>Phlebia</i>
<i>Phlebia lilascens</i>	2		Agaricomycetes	Polyporales	Meruliaceae	<i>Phlebia</i>
<i>Phlebia radiata</i>	9	5	Agaricomycetes	Polyporales	Meruliaceae	<i>Phlebia</i>

<i>Phlebia subochracea</i>	10		Agaricomycetes	Polyporales	Meruliaceae	<i>Phlebia</i>
<i>Phlebia tremelloidea</i>	1		Agaricomycetes	Polyporales	Meruliaceae	<i>Phlebia</i>
<i>Phlebia tuberculata</i>	1		Agaricomycetes	Polyporales	Meruliaceae	<i>Phlebia</i>
<i>Phlebiopsis gigantea</i>	3	4	Agaricomycetes	Polyporales	Meruliaceae	<i>Phlebiopsis</i>
<i>Phylloporia ribis</i>	1	4	Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Phylloporia</i>
<i>Piptoporus betulinus</i>	2	11	Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Piptoporus</i>
<i>Piptoporus quercinus</i>	1		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Piptoporus</i>
<i>Polyporus alveolaris</i>	5	5	Agaricomycetes	Polyporales	Polyporaceae	<i>Polyporus</i>
<i>Polyporus arcularius</i>	6	5	Agaricomycetes	Polyporales	Polyporaceae	<i>Polyporus</i>
<i>Polyporus ciliatus</i>	1		Agaricomycetes	Polyporales	Polyporaceae	<i>Polyporus</i>
<i>Polyporus squamosus</i>		4	Agaricomycetes	Polyporales	Polyporaceae	<i>Polyporus</i>
<i>Polyporus varius</i>	2		Agaricomycetes	Polyporales	Polyporaceae	<i>Polyporus</i>
<i>Porodaedalea pini</i>	4	4	Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Porodaedalea</i>
<i>Porostereum spadiceum</i>	21	5	Agaricomycetes	Polyporales	Meruliaceae	<i>Porostereum</i>
<i>Postia alni</i>	15		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Postia</i>
<i>Postia floriformis</i>	1		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Postia</i>
<i>Postia leucomallella</i>	8		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Postia</i>
<i>Postia stiptica</i>	1		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Postia</i>
<i>Postia tephroleuca</i>	1		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Postia</i>
<i>Pseudoinonotus dryadeus</i>	2		Agaricomycetes	Hymenochaetales	Hymenochaetaceae	<i>Pseudoinonotus</i>
<i>Radulodon aneirinus</i>	5		Agaricomycetes	Polyporales	Cerrenaceae	<i>Radulodon</i>
<i>Radulomyces confluens</i>	107	2	Agaricomycetes	Agaricales	Pterulaceae	<i>Radulomyces</i>

<i>Radulomyces molaris</i>	21	6	Agaricomycetes	Agaricales	Pterulaceae	<i>Radulomyces</i>
<i>Ramaria abietina</i>	1		Agaricomycetes	Gomphales	Gomphaceae	<i>Ramaria</i>
<i>Ramaria corrugata</i>	1		Agaricomycetes	Gomphales	Gomphaceae	<i>Ramaria</i>
<i>Ramaria flaccida</i>	9		Agaricomycetes	Gomphales	Gomphaceae	<i>Ramaria</i>
<i>Ramaria ochracea</i>	1		Agaricomycetes	Gomphales	Gomphaceae	<i>Ramaria</i>
<i>Ramaria stricta</i>	1		Agaricomycetes	Gomphales	Gomphaceae	<i>Ramaria</i>
<i>Resupinatus poriaeformis</i>	4		Agaricomycetes	Agaricales	Tricholomataceae	<i>Resupinatus</i>
<i>Rigidoporus pouzarii</i>	2		Agaricomycetes	Polyporales	Meripilaceae	<i>Rigidoporus</i>
<i>Rigidoporus sanguinolentus</i>	5		Agaricomycetes	Polyporales	Meripilaceae	<i>Rigidoporus</i>
<i>Royoporus badius</i>	3		Agaricomycetes	Polyporales	Polyporaceae	<i>Royoporus</i>
<i>Sarcodontia pachyodon</i>	1		Agaricomycetes	Polyporales	Meruliaceae	<i>Sarcodontia</i>
<i>Schizophyllum amplum</i>	13	10	Agaricomycetes	Agaricales	Schizophyllaceae	<i>Schizophyllum</i>
<i>Schizophyllum commune</i>	17	46	Agaricomycetes	Agaricales	Schizophyllaceae	<i>Schizophyllum</i>
<i>Schizopora flavipora</i>	21	6	Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Schizopora</i>
<i>Schizopora paradoxa</i>	18	4	Agaricomycetes	Hymenochaetales	Schizoporaceae	<i>Schizopora</i>
<i>Scopuloides hydroides</i>	10		Agaricomycetes	Polyporales	Meruliaceae	<i>Scopuloides</i>
<i>Scytinostroma hemidichophyticum</i>	6		Agaricomycetes	Russulales	Lachnocladiaceae	<i>Scytinostroma</i>
<i>Serpula himantioides</i>	5	1	Agaricomycetes	Boletales	Serpulaceae	<i>Serpula</i>
<i>Sistotrema binucleosporum</i>	1		Agaricomycetes	Cantharellales	Cantharellales fam incertae sedis	<i>Sistotrema</i>
<i>Sistotrema brinkmannii</i>	36		Agaricomycetes	Cantharellales	Cantharellales fam incertae sedis	<i>Sistotrema</i>
<i>Sistotrema diademiferum</i>	2		Agaricomycetes	Cantharellales	Cantharellales fam incertae sedis	<i>Sistotrema</i>

<i>Sistotrema oblongisporum</i>	1		Agaricomycetes	Cantharellales	Cantharellales fam incertae sedis	<i>Sistotrema</i>
<i>Sistotrema octosporum</i>	1		Agaricomycetes	Cantharellales	Cantharellales fam incertae sedis	<i>Sistotrema</i>
<i>Sistotrema porulosum</i>	1		Agaricomycetes	Cantharellales	Cantharellales fam incertae sedis	<i>Sistotrema</i>
<i>Sistotrema resinocystidium</i>	1		Agaricomycetes	Cantharellales	Cantharellales fam incertae sedis	<i>Sistotrema</i>
<i>Sistotrema seranderi</i>	2		Agaricomycetes	Cantharellales	Cantharellales fam incertae sedis	<i>Sistotrema</i>
<i>Sistotrema</i> sp.	3		Agaricomycetes	Cantharellales	Cantharellales fam incertae sedis	<i>Sistotrema</i>
<i>Sistotremastrum niveocreum</i>	6		Agaricomycetes	Trechisporales	Trechisporales fam incertae sedis	<i>Sistotremastrum</i>
<i>Sistotremastrum suecicum</i>	16		Agaricomycetes	Trechisporales	Trechisporales fam incertae sedis	<i>Sistotremastrum</i>
<i>Sistotremella hauerslevii</i>	1		Agaricomycetes	Trechisporales	Hydnodontaceae	<i>Sistotremella</i>
<i>Skeletocutis amorphia</i>	3		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Skeletocutis</i>
<i>Skeletocutis carneogrisea</i>	17	2	Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Skeletocutis</i>
<i>Skeletocutis nivea</i>	6		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Skeletocutis</i>
<i>Steccherinum bourdotii</i>	2		Agaricomycetes	Polyporales	Steccherinaceae	<i>Steccherinum</i>
<i>Steccherinum fimbriatum</i>	21	6	Agaricomycetes	Polyporales	Steccherinaceae	<i>Steccherinum</i>
<i>Steccherinum ochraceum</i>	13	6	Agaricomycetes	Polyporales	Steccherinaceae	<i>Steccherinum</i>
<i>Steccherinum oreophilum</i>	1		Agaricomycetes	Polyporales	Steccherinaceae	<i>Steccherinum</i>
<i>Stereum gausapatum</i>	2	2	Agaricomycetes	Russulales	Stereaceae	<i>Stereum</i>
<i>Stereum hirsutum</i>	32	24	Agaricomycetes	Russulales	Stereaceae	<i>Stereum</i>
<i>Stereum sanguinolentum</i>	4	4	Agaricomycetes	Russulales	Stereaceae	<i>Stereum</i>

<i>Stereum submentosum</i>	33	20	Agaricomycetes	Russulales	Stereaceae	<i>Stereum</i>
<i>Stypella dubia</i>	1		Agaricomycetes	Auriculariales	Hyaloriaceae	<i>Stypella</i>
<i>Stypella grilletii</i>	1		Agaricomycetes	Auriculariales	Hyaloriaceae	<i>Stypella</i>
<i>Subulcystidium longisporum</i>	20		Agaricomycetes	Russulales	Peniophoraceae	<i>Subulcystidium</i>
<i>Thanatephorus fusisporus</i>	3		Agaricomycetes	Cantharellales	Ceratobasidiaceae	<i>Thanatephorus</i>
<i>Thelephora terrestris</i>	5	6	Agaricomycetes	<i>Thelephorales</i>	Thelephoraceae	<i>Thelephora</i>
<i>Thelephorales</i> sp.	2		Agaricomycetes	<i>Thelephorales</i>	<i>Thelephorales</i> fam incertae sedis	<i>Thelephorales</i> gen incertae sedis
<i>Tomentella badia</i>	1		Agaricomycetes	<i>Thelephorales</i>	Thelephoraceae	<i>Tomentella</i>
<i>Tomentella ferruginea</i>	2		Agaricomycetes	<i>Thelephorales</i>	Thelephoraceae	<i>Tomentella</i>
<i>Tomentella italica</i>	1		Agaricomycetes	<i>Thelephorales</i>	Thelephoraceae	<i>Tomentella</i>
<i>Tomentella pilosa</i>	2		Agaricomycetes	<i>Thelephorales</i>	Thelephoraceae	<i>Tomentella</i>
<i>Tomentella radiosa</i>	2		Agaricomycetes	<i>Thelephorales</i>	Thelephoraceae	<i>Tomentella</i>
<i>Tomentella</i> sp.	1		Agaricomycetes	<i>Thelephorales</i>	Thelephoraceae	<i>Tomentella</i>
<i>Tomentella spinospora</i>	7		Agaricomycetes	<i>Thelephorales</i>	Thelephoraceae	<i>Tomentella</i>
<i>Tomentella stuposa</i>	3		Agaricomycetes	<i>Thelephorales</i>	Thelephoraceae	<i>Tomentella</i>
<i>Tomentella subllacina</i>	4		Agaricomycetes	<i>Thelephorales</i>	Thelephoraceae	<i>Tomentella</i>
<i>Tomentella subtestacea</i>	1		Agaricomycetes	<i>Thelephorales</i>	Thelephoraceae	<i>Tomentella</i>
<i>Tomentellopsis bresadolana</i>	26		Agaricomycetes	<i>Thelephorales</i>	Thelephoraceae	<i>Tomentellopsis</i>
<i>Tomentellopsis echinospora</i>	1		Agaricomycetes	<i>Thelephorales</i>	Thelephoraceae	<i>Tomentellopsis</i>
<i>Tomentellopsis pulchella</i>	3		Agaricomycetes	<i>Thelephorales</i>	Thelephoraceae	<i>Tomentellopsis</i>
<i>Tomentellopsis</i> sp.	19		Agaricomycetes	<i>Thelephorales</i>	Thelephoraceae	<i>Tomentellopsis</i>
<i>Trametes hirsuta</i>	7	9	Agaricomycetes	Polyporales	Coriolaceae	<i>Trametes</i>
<i>Trametes ljubarskyi</i>	4	1	Agaricomycetes	Polyporales	Coriolaceae	<i>Trametes</i>

<i>Trametes ochracea</i>	22	19	Agaricomycetes	Polyporales	Coriolaceae	<i>Trametes</i>
<i>Trametes pubescens</i>	1		Agaricomycetes	Polyporales	Coriolaceae	<i>Trametes</i>
<i>Trametes suaveolens</i>	2		Agaricomycetes	Polyporales	Coriolaceae	<i>Trametes</i>
<i>Trametes trogii</i>	13	14	Agaricomycetes	Polyporales	Coriolaceae	<i>Trametes</i>
<i>Trametes versicolor</i>	9		Agaricomycetes	Polyporales	Coriolaceae	<i>Trametes</i>
<i>Trametopsis cervina</i>	3		Agaricomycetes	Polyporales	Meruliaceae	<i>Trametopsis</i>
<i>Trechinothus smardae</i>	1		Agaricomycetes	Agaricomycetes ord incertae sedis	Agaricomycetes fam incertae sedis	<i>Trechinothus</i>
<i>Trechispora alnicola</i>	3		Agaricomycetes	Trechisporales	Hydnodontaceae	<i>Trechispora</i>
<i>Trechispora cohaerens</i>	19		Agaricomycetes	Trechisporales	Hydnodontaceae	<i>Trechispora</i>
<i>Trechispora confinis</i>	2		Agaricomycetes	Trechisporales	Hydnodontaceae	<i>Trechispora</i>
<i>Trechispora farinacea</i>	4		Agaricomycetes	Trechisporales	Hydnodontaceae	<i>Trechispora</i>
<i>Trechispora hypoleucum</i>	1		Agaricomycetes	Trechisporales	Hydnodontaceae	<i>Trechispora</i>
<i>Trechispora kavinioides</i>	1		Agaricomycetes	Trechisporales	Hydnodontaceae	<i>Trechispora</i>
<i>Trechispora microspora</i>	2		Agaricomycetes	Trechisporales	Hydnodontaceae	<i>Trechispora</i>
<i>Trechispora nivea</i>	2		Agaricomycetes	Trechisporales	Hydnodontaceae	<i>Trechispora</i>
<i>Trechispora praefocata</i>	1		Agaricomycetes	Trechisporales	Hydnodontaceae	<i>Trechispora</i>
<i>Trechispora stevensonii</i>	15		Agaricomycetes	Trechisporales	Hydnodontaceae	<i>Trechispora</i>
<i>Trichaptum biforme</i>	6	2	Agaricomycetes	Hymenochaetales	Hymenochaetales fam incertae sedis	<i>Trichaptum</i>
<i>Trichaptum fuscoviolaceum</i>	29	20	Agaricomycetes	Hymenochaetales	Hymenochaetales fam incertae sedis	<i>Trichaptum</i>
<i>Tubulicrinis calothrix</i>	1		Agaricomycetes	Hymenochaetales	Tubulicrinaceae	<i>Tubulicrinis</i>

<i>Tubulicrinis strangulatus</i>	1		Agaricomycetes	Hymenochaetales	Tubulicrinaceae	<i>Tubulicrinis</i>
<i>Tubulicrinis subulatus</i>	1		Agaricomycetes	Hymenochaetales	Tubulicrinaceae	<i>Tubulicrinis</i>
<i>Tulasnella albida</i>	7		Agaricomycetes	Cantharellales	Tulasnellaceae	<i>Tulasnella</i>
<i>Tulasnella brinkmannii</i>	1		Agaricomycetes	Cantharellales	Tulasnellaceae	<i>Tulasnella</i>
<i>Tulasnella deliquescens</i>	1		Agaricomycetes	Cantharellales	Tulasnellaceae	<i>Tulasnella</i>
<i>Tulasnella eichleriana</i>	11		Agaricomycetes	Cantharellales	Tulasnellaceae	<i>Tulasnella</i>
<i>Tulasnella hyalina</i>	1		Agaricomycetes	Cantharellales	Tulasnellaceae	<i>Tulasnella</i>
<i>Tulasnella pallida</i>	12		Agaricomycetes	Cantharellales	Tulasnellaceae	<i>Tulasnella</i>
<i>Tulasnella pinicola</i>	1		Agaricomycetes	Cantharellales	Tulasnellaceae	<i>Tulasnella</i>
<i>Tulasnella pruinosa</i>	1		Agaricomycetes	Cantharellales	Tulasnellaceae	<i>Tulasnella</i>
<i>Tulasnella saveloides</i>	6		Agaricomycetes	Cantharellales	Tulasnellaceae	<i>Tulasnella</i>
<i>Tulasnella</i> sp.	5		Agaricomycetes	Cantharellales	Tulasnellaceae	<i>Tulasnella</i>
<i>Tulasnella thelephorea</i>	5		Agaricomycetes	Cantharellales	Tulasnellaceae	<i>Tulasnella</i>
<i>Tulasnella tomaculum</i>	1		Agaricomycetes	Cantharellales	Tulasnellaceae	<i>Tulasnella</i>
<i>Tulasnella violea</i>	8		Agaricomycetes	Cantharellales	Tulasnellaceae	<i>Tulasnella</i>
<i>Typhula erythropus</i>	4		Agaricomycetes	Agaricales	Typhulaceae	<i>Typhula</i>
<i>Typhula euphorbiae</i>	1		Agaricomycetes	Agaricales	Typhulaceae	<i>Typhula</i>
<i>Typhula micans</i>	1		Agaricomycetes	Agaricales	Typhulaceae	<i>Typhula</i>
<i>Typhula setipes</i>	25		Agaricomycetes	Agaricales	Typhulaceae	<i>Typhula</i>
<i>Typhula</i> sp.	10		Agaricomycetes	Agaricales	Typhulaceae	<i>Typhula</i>
<i>Typhula sphaeroidea</i>	5		Agaricomycetes	Agaricales	Typhulaceae	<i>Typhula</i>
<i>Tyromyces chioneus</i>	3		Agaricomycetes	Polyporales	Fomitopsidaceae	<i>Tyromyces</i>
<i>Vararia ochroleuca</i>	2		Agaricomycetes	Russulales	Lachnocladiaceae	<i>Vararia</i>

<i>Vuilleminia comedens</i>	24	18	Agaricomycetes	Corticiales	Vuilleminiaceae	<i>Vuilleminia</i>
<i>Vuilleminia coryli</i>	5	5	Agaricomycetes	Corticiales	Vuilleminiaceae	<i>Vuilleminia</i>
<i>Vuilleminia cystidiata</i>	2	1	Agaricomycetes	Corticiales	Vuilleminiaceae	<i>Vuilleminia</i>
<i>Vuilleminia pseudocystidiata</i>	1		Agaricomycetes	Corticiales	Vuilleminiaceae	<i>Vuilleminia</i>
<i>Xenasmatella</i> sp.	1		Agaricomycetes	Agaricomycetes ord incertae sedis	Xenasmataceae	<i>Xenasmatella</i>
<i>Xenasmatella vaga</i>	5		Agaricomycetes	Agaricomycetes ord incertae sedis	Xenasmataceae	<i>Xenasmatella</i>

Most of the species belong to subphylum Agaricomycotina, class Agaricomycetes and represent 14 orders (Agaricales, Atheliales, Amylocorticiales, Auriculariales, Cantharellales, Boletales, Gloeophyllales, Corticiales, Hymenochaetales, Gomphales, Polyporales, Russulales, *Thelephorales* and Trechisporales). One genus belongs to a separate lineage of presumably order level (*Xenasmatella* spp.) and five species have an unclear position within Agaricomycetes (three *Dendrothele* spp., *Granulobasidium vellereum* and *Trechinothus smardae*). Three species in the dataset represent the subphylum Pucciniomycotina: *Helicogloea farinacea* and *H. lagerheimii* (Atractiellales, Atractiellomycetes) and *Colacogloea peniophorae* (Microbotryomycetes).

The dataset includes several species described or raised to the species level status in the last two decades: *Antrodiella ichnusana*, *Lyomyces erastii*, *L. incrustatus*, *Phlebia tuberculata* and *Xylodon tuberculatus*. We could use these names for identification purposes by 2012, i.e. by the end of specimen identification phase of the project. However, to some specimens, new important identifications were added in the course of taxonomic revisions published after 2011 (Table 4). Further important recent nomenclatural innovations reflected in the dataset are treating *Tomentella crinalis* and *T. fibrosa* in the separate genus *Odontia*, following Tedersoo et al. (2014).

Table 4.

Re-identifications of the eastern Ukrainian fungal collections based on recent taxonomical revisions. For all such species, the specimens were studied and cited personally by the authors of the new names (but see comment for *Antrodia hyalina*).

Original identification	Current name	Reference
<i>Antrodia pulvinascens</i>	<i>Antrodia hyalina</i>	V. Spirin, personal communication; see also Spirin et al. 2013
<i>Eichleriella deglubens</i>	<i>Heteroradulum kmetii</i>	Malysheva and Spirin 2017

<i>Phanerochaete magnoliae</i>	<i>Phanerochaete cumulodentata</i>	Volobuev et al. 2015
<i>Phanerochaete sordida</i>	<i>Phanerochaete livescens</i>	Volobuev et al. 2015
<i>Rigidoporus crocatus</i>	<i>Rigidoporus pouzarii</i>	Vampola and Vlasák 2012

From 19 specimens representing 16 species, we generated 19 nuclear ribosomal DNA ITS sequences and four 28S sequences. Further seven ITS and two 28S sequences were produced in collaborative studies focusing on a particular taxonomic problem (see Table 4). The sequences can be found in the public repositories UNITE (Kõljalg et al. 2013) and GenBank (Benson et al. 2013) and linked to the respective CWU vouchers in PlutoF. The sequence [UDB033929*1](#) from specimen [CWU4336*1](#) is the first barcode sequence for the species *Phellinus rhamnii*. Our photographs of *Dichomitus squalens* ([CWU6509](#)) and *Lenzites warnieri* ([CWU6505](#)) linked to the dataset illustrate the respective species in the latest key to European polypores (Ryvarden and Melo 2014).

Traits coverage

The assignments to the 1) lifestyle and 2) fruiting-body principal configuration (morph) type were provided for each species. Lifestyle is a predefined field in PlutoF, from which we used the categories saprotroph, symbiotroph and parasite.

The principal fruitbody configuration of macrofungi is an increasingly addressed species trait in the ecological and evolutionary studies (Abrego et al. 2016, Hibbett 2007). We classified the species of our dataset into the following groups: those where fruitbodies have smooth spore-producing surface (corticoid), species with cup-shaped fruitbodies (cyphelloid), species with toothed hymenophore (hydroid), species developing pores (poroid), species having gelified fruiting bodies (heterobasidial) and species having coralloid, club-like or funnel-like fruiting bodies which grow negatively geotropic (clavarioid). As the trait module for fungi in PlutoF is still under development (July 2017), we specified the fruiting body morph in the field "Identifications.Remarks" for each specimen and observation.

Temporal coverage

Data range: 2007-3-09 - 2011-5-07.

Collection data

Collection name: All the specimens are stored in the V.N. Karazin National University Herbarium, Kharkiv, Ukraine (CWU). Many specimens belonging to the order *Thelephorales* are recorded in PlutoF having their main deposition place as: University of Tartu; Natural History Museum and Botanic Garden; Botanical and Mycological Museum;

Department of Mycology, TU(M). The duplicates of CWU specimens studied by colleagues were placed in the herbaria of their institutions: M.G. Kholodny Institute of Botany, National Academy of Sciences of Ukraine (KW), V.F. Kuprevich Institute of Experimental Botany, Belarus Academy of Sciences (MSK), V.L. Komarov Botanical Institute (LE) and Institute of Plant and Animal Ecology (SVER) of the Russian Academy of Sciences, University of Gothenburg (GB) and personal collections of Josef Vlasák, Wolfgang Dämon, Heikki Kotiranta and Masoomeh Ghobad-Nejhad (will join the Iranian Cryptogamic Herbarium, ICH).

Collection identifier: CWU, TU(M), KW, MSK, LE, SVER, GB, ICH.

Specimen preservation method: Fresh specimens were dried with an electric fan dryer on the day of collection and placed in grip seal plastic bags. Shortly after drying, the specimens were placed into a deep freezer (−20°C) for a week, to prevent their destruction by insects. Specimens are preserved in cardboard herbarium boxes.

Curatorial unit: CWU fungal specimens are curated by the Department of Mycology and Plant Resistance of V.N. Karazin Kharkiv National University, Ukraine.

Usage rights

Use license: Open Data Commons Attribution License

IP rights notes: The dataset is hosted by PlutoF and accessible from the latter under Attribution-NonCommercial-ShareAlike 4.0 International License (CC BY-NC-SA 4.0). The source records compiled into the dataset are available in the dedicated PlutoF project (<https://plutof.ut.ee/#/study/view/38925>). Project specimens and sequences are open for alternative taxon identifications. The occurrence records may also be viewed in the GBIF occurrence dataset of CWU herbarium (Savchenko 2017, <https://doi.org/10.15468/kuspj6>) and the GBIF dataset of PlutoF platform observations (PlutoF 2017, <https://doi.org/10.15468/h7qftd>). All data resources are also provided in Suppl. material 1.

Data resources

Data package title: Aphyllorphoroid fungi in insular woodlands of eastern Ukraine.

Resource link: <http://dx.doi.org/10.15156/BIO/587471>

Alternative identifiers: <https://plutof.ut.ee/#/study/view/38925>

Number of data sets: 3

Data set name: Specimens

Character set: UTF-8

Download URL: <https://data.datacite.org/application/zip/10.15156/BIO/587471>

Data format: Darwin Core Archive

Data format version: 1.0

Description: Specimens of aphylophoroid fungi (non-gilled macroscopic *Basidiomycota*) from eastern Ukraine collected between 2007 and 2011.

Column label	Column description
http://rs.tdwg.org/dwc/terms/	See terms in the link

Data set name: Observations

Character set: UTF-8

Download URL: <https://data.datacite.org/text/zip-1072799/10.15156/BIO/587471>

Data format: Darwin Core Archive

Data format version: 1.0

Description: Observations of aphylophoroid fungi (non-gilled macroscopic *Basidiomycota*) from eastern Ukraine made between 2007 and 2011.

Column label	Column description
http://rs.tdwg.org/dwc/terms/	See terms in the link

Data set name: Areas shape files

Character set: UTF-8

Download URL: <http://data.datacite.org/text/x-rar/10.15156/BIO/587471>

Data format: ESRI Shapefile

Description: Shapefile of all sampling areas used in the study

Column label	Column description
id	Short identifier without whitespaces (text string)
name	Full names of areas (text string)

Additional information

Results communication

The results of species inventories in eastern Ukraine were communicated and discussed at several conferences and meetings attended by Alexander Ordynets and Alexander Akulov:

- Conferences for young scientists organised by M.G. Kholodny Institute of Botany, National Academy of Sciences of Ukraine (2008 in Kamianets-Podilskyi, 2009 in Kremianets, 2010 and 2011 in Kiev, Ukraine);
- Conferences for young scientists organised by V.N. Karazin National University in Kharkiv, Ukraine (2008-2011);
- Presentations on Ukrainian fungi at the Microbial Evolution Research Group, University of Oslo (2012-10-16) and Botanical Museum, University of Oslo (2014-03-27);
- Field course on identification of corticioid Basidiomycetes (2012-09-10 – 2012-09-15) and winter seminar (2013-02-25), organised by the Chair of Mycology, Institute of Ecology and EarthSciences, University of Tartu, Estonia;
- Presentation on Ukrainian fungi diversity at the Department of Mycology, University of Marburg, Germany (2013-06-17).

Outlook

While uploading and processing our data in the PlutoF system, we found that some species were missing in the PlutoF classification. Therefore we added manually to the PlutoF taxonomy one genus (*Heteroradulum*) and the six following species: *Basidiodendron deminutum*, *B. rimulentum*, *Heteroradulum kmetii*, *Hyphodontia incrustata*, *Maireina maxima* and *Trechinothus smardae*. Two more species, *Sistotremella hauerlevii* and *Henningsomyces stipitatus*, were added to PlutoF classification by means of import from the GBIF Backbone Taxonomy of 2016. One plant species, *Prunus stepposa*, was also manually added to the Plantae kingdom of PlutoF taxonomy. These taxon additions will ease the data upload for subsequent PlutoF users.

Our data contribute to more than a doubling in size of the digitised CWU herbarium, the first and the largest digital collection outside Estonia hosted by PlutoF (Savchenko 2017). Our dataset sheds further light on the fungal diversity of Eastern Europe and it is anticipated that it will complement other data sources on European fungi in addressing macroecological and biogeographical questions. It is also hoped that the example of this data paper will promote further effective enrichment of PlutoF platform with fungal occurrence data.

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Author contributions

Alexander Ordynets and Alexander Akulov are the main collectors of specimens and observations. Alexander Ordynets, Alexander Akulov, Eugene Yurchenko, Vera Malysheva, Urmas Kõljalg, Josef Vlasák, Karl-Henrik Larsson and Wolfgang Dämon identified the specimens. Urmas Kõljalg, Josef Vlasák, Karl-Henrik Larsson and Ewald Langer sequenced some of the specimens. Alexander Ordynets and Anton Savchenko uploaded data to the PlutoF workbench and further managed it. Alexander Ordynets wrote the first version of the manuscript and all co-authors contributed to the writing.

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Supplementary material

Suppl. material 1: Data resources: Aphyllorphoroid fungi in insular woodlands of eastern Ukraine [doi](#)

Authors: Alexander Ordynets, Anton Savchenko, Alexander Akulov, Eugene Yurchenko, Vera Malysheva, Urmas Kõljalg, Josef Vlasák, Karl-Henrik Larsson, Ewald Langer

Data type: occurrences, links to multimedia

Brief description: Separate Darwin Core Archives for specimens and observations, plus shape files of sampling areas.

Filename: Ordynets_et_al_e-Ukraine_data_resources.zip - [Download file](#) (162.45 kb)

Endnotes

*1 open for registered users of PlutoF platform (Abarenkov et al. 2010, <https://plutof.ut.ee>)