

New records of cup-fungi from Iceland with comments on some previously reported species

Donald H. Pfister and Guðrīður Gyða Eyjólfsdóttir

D. H. Pfister (dpfister@oeb.harvard.edu), Harvard Univ. Herbaria, 22 Divinity Avenue, Cambridge, MA 02138, USA. – Guðrīður Gyða Eyjólfsdóttir, Icelandic Inst. of Nat. History, Akureyri Div., Borgir at Norðurslóð, PO Box 180, IS-602, Akureyri, Iceland.

Twelve species of cup-fungi in the orders Pezizales and Helotiales are reported for the first time from Iceland and comments are made on eight species previously reported. Distributions and habitats are noted. Newly reported records of species occurrences are as follows: *Ascocoryne cyllichnium*, *Gloeotinia granigena*, *Melastiza flavorubens*, *Octospora melina*, *O. leucoloma*, *Ombrophila violacea*, *Peziza apiculata* sensu lato, *P. phyllogena*, *P. succosa*, *Pseudombrophila theioleuca*, *Ramsbottomia macracantha* and *Tarsetta cupularis*. Recent work allows the re-identification of *Peziza granulosa* as *P. fimeti*.

The microfungi of Iceland has been most recently summarized by Hallgrímsson and Eyjólfsdóttir (2004). The present authors collaborated in undertaking field and herbarium studies in 2004 focusing particularly on the cup-fungi in the orders Pezizales and Helotiales. This study has resulted in several new records of these fungi for Iceland and it helps to stabilize some of the names in current use. These records also further document the distribution of species in the Nordic countries, and the occurrence of certain of these fungi suggests that future work might productively be done on the biology of some of them and particularly their interactions with plants. A further contribution of these studies is the well-documented, authoritatively identified set of specimens in the herbarium of the Iceland Inst. of Nat. History which are verified and arranged in accordance with the accepted taxonomy for these groups. These specimens provide a valuable baseline for comparison in future mycological studies in Iceland.

Iceland offers unique opportunities for the study of the biology of fungi. Because Iceland's vascular plant flora is limited to about 500 species (Kristinsson 2007), observations, interaction studies and associations can be more directly detected than in more diverse habitats. Introductions of woody plant species are relatively well documented and the age and origins of specific plants and plantations are often known precisely. Furthermore, Iceland's geology is dynamic and landscapes are unstable because of the effects of erosion, landslides and volcanic activities. In such disturbed habitats fruiting of certain fungi, such as the Pezizales, may be promoted. The vegetational history and the long history of human habitation and concomitant land

use patterns are documented. Studies of the diversity and distribution of fungi in Iceland are thus delimited by perhaps fewer variables than in areas of higher plant diversity.

The interaction of these fungi with vascular plants is of particular interest in light of investigations on the mycorrhizal associations formed by members of the Pezizales. Tedersoo et al. (2006) have shown through morphotyping and sequencing of roots from temperate forests in northern Europe that a number of these fungi form ectomycorrhiza (EcM) with forest trees. The fungus *Trichophaea hybrida* (Sowerby) T. Schumach. is reported below and was shown by Tedersoo et al. (2006) to form EcM with *Picea abies*. While we did not collect root samples in Iceland, we did collect ascomatal tissue for molecular phylogenetic study. Perry et al. (2007) used one of these collections in their phylogenetic study of the Pyrenomataceae. The root sample of Tedersoo et al. (2006), one collection from Iceland cited here, and another collection had nearly identical sequences. We might assume that this is a fungus associated with members of the Pinaceae and that it is a fungus that is not native to Iceland, as the only conifer in the native flora of Iceland is *Juniperus communis* subspecies *nana*, a plant that forms endomycorrhizae, not ectomycorrhizae as in *T. hybrida*. Although at this time it is not possible to trace the introduction point or to determine the host(s) on which this fungus was introduced, it is interesting to note that all collections from Iceland have been made in planted conifer stands. The distribution of *T. hybrida* in Iceland will be of interest in exploring questions related to success of the introduced

plants and the movement of the fungus. Another example is also worth mentioning; material of *Tarzetta spurcata* (Pers.) Harmaja from Iceland was used in the analyses by Perry et al. (2007) and was shown to be nearly identical to a specimen of *T. catinus* from Denmark cited by Tedersoo et al. (2006). It appears that members of the genus *Tarzetta* form mycorrhizae. The material used by Tedersoo et al. (2006) came from *Fagus sylvatica*, a plant not part of the Iceland flora, indeed a member of a family (Fagaceae) that is not known from our native flora. It is possible that *T. spurcata* associates with the native birch, *Betula pubescens*, in Iceland.

Material and methods

These studies are based principally on collections made in July 2004, mostly in the vicinity of Akureyri in northern Iceland and by one of us, DHP, in the vicinity of Egilsstaðir in eastern Iceland. In addition, all the Pezizales and some Helotiales in the herbarium of the Icelandic Inst. of Nat. Hist., Akureyri Div. (AMNH) were examined and annotated.

New reports were determined by consultation of summary works by Hansen and Knudsen (2000) and Hallgrímsson and Eyjólfsdóttir (2004). Biodiversity occurrence data were also provided by: Nat. Hist. Mus., Univ. of Oslo: Mycology Herbarium, Oslo (O); The Danish Biodiv. Info Facility: Bot. Mus., Copenhagen, Mycology Herbarium (C); The Swedish Mus. of Nat. Hist. (NRM): Fungi (S) (Accessed through GBIF data portal, www.gbif-net, 2007-06-25). Except where noted the authors (DHP and GGE) are the collectors and the numbers in parentheses after DHP are collection numbers. Material is deposited in the herbarium of the Icelandic Inst. of Nat. Hist. (ICEL), Akureyri Division (AMNH) and in the Farlow Herbarium, Harvard Univ. (FH). Abbreviated collection data is given; full geo-reference information can be found in GBIF and the distribution of species based on specimens primarily at AMNH can be found on the ICEL website (<http://vefsja.ni.is/website/plontuvefsja/>). In a few cases where there are many specimens of a particular species and the species is widespread, only the AMNH numbers are listed. The numbers, prefixed by FA are listed throughout and all refer to the fungus herbarium of AMNH. The phytogeographic regions within Iceland are indicated according to a system employed by Hallgrímsson and Eyjólfsdóttir (2004) i.e. INa for northeastern Iceland and Iau for eastern Iceland. The administrative districts (sýsla) where collections were made are abbreviated, for example Eyf., S.-Þing., N.-Múl. for Eyjafjarðarsýsla, Suður-Þingeyjarsýsla and Norður-Múlasýsla, respectively.

Taxa are arranged under the order to which they are assigned and basionyms are listed. Synonyms are listed in those instances where significant literature exists under the synonymous names; other nomenclatural synonyms can be found in Index Fungorum (<http://www.indexfungorum.org/names/Names.asp>).

Helotiales

Ascocoryne cylichnium (Tul.) Korf, *Phytologia* 21: 202 (1971)

Basionym: *Peziza cylichnium* Tul., Ann. Sci. Nat. ser. 3 20: 174 (1853).

This species has not been reported previously in Iceland and is known from a single collection. Four species of *Ascocoryne* have been reported in the Nordic countries. Hallgrímsson and Göttsche (1990) noted *A. sarcooides* (Jacq.) J. W. Groves & D. E. Wilson in Iceland and reported it to be rather widespread. They suggested that *A. cylichnium* might also be present intermixed among the mostly anamorphic collections they examined. Our identification of this collection confirms their supposition. *A. cylichnium* differs from *A. sarcooides* in spore size and septation. Spores of *A. cylichnium* are larger (up to 33 µm long) and are multi-septate; those of *A. sarcooides* reach a length of up to 18 µm and have 1–3 septa. Furthermore, ascospores of *A. cylichnium* sometimes directly develop small conidia when spores are still within asci. It is the senior author's experience in collecting members of this genus in widespread localities that species distinctions are not clear and the taxonomy needs to be re-evaluated in the context of morphological and molecular diversity.

Habitat

In woodland on a rotten stump.

Material examined

Vaglaskógur woodland Fnjóskadalur, S.-Þing., INa, 100–160 m, 6 Sep 1972, Hörður Kristinsson (FA17657).

Distribution

Ascocoryne cylichnium is common in Denmark, common to occasional in Norway north to Troms District, and is occasionally encountered in both Sweden and Finland (Hansen and Knudsen 2000).

Cudoniella clavus (Alb. & Schwein.: Fr.) Dennis, *Persoonia* 3: 73 (1964)

Basionym: *Peziza clavus* Alb. & Schwein., Consp. fung. Lusat. p. 306 (1805).

Previously Hallgrímsson and Eyjólfsdóttir (2004) listed a collection of this species from Egilsstaðir on wood submerged in water. In contrast, and somewhat unusually, our collection, from near Akureyri, was found on submerged herbaceous stems. We list the specimen here to draw attention to the variation in substrate.

Habitat

On herbaceous stems in stream, and on birch twigs in a stream in woodland.

Material examined

Vaðlaskógur woodland, Eyf., INa, 40 m, 27 Jul 2004, DHP (04-554) and GGE (FH, FA17846); Vaglaskógur woodland Fnjóskadalur, S.-Þing., INa, 160–170 m, 28 Jul 2004 (FA17679).

Distribution

In the Nordic countries *C. clavus* seems not to be frequently collected and is considered rare at least in some parts of Norway and Sweden (Hansen and Knudsen 2000).

Gloeotinia granigena (Quél.) T. Schumach., Mycotaxon 8: 125 (1979)

Basionym: *Phialea granigena* Quél., Assoc. Franç. Avancem. Sci. 1882: 21 (1883).

Synonyms: *Ciboria granigena* (Quél.) N. F. Buchw., Kongel. Veterin. Landbohøjskole. Årsskr. 32: 165 (1949) – *Gloeotinia temulenta* (Prill. & Delacr.) M. Wilson, Noble & E. G. Gray, Trans. Br. Mycol. Soc. 37: 31 (1954).

This is the first report of this fungus from Iceland. It was formerly and widely known under the name *Gloeotinia temulenta*; it causes 'blind seed' disease in grasses and has been studied in cereal growing regions. Within the Poaceae a number of hosts have been found as summarized by Hardison (1962) and Schumacher (1979). In this case Hörður Kristinsson, Icelandic Inst. of Nat. Hist., suggested the host to be *Deschampsia caespitosa*. The identification of the host is tentative since it was only after the minute apothecia were brought back to the laboratory and examined under magnification that the stalked apothecia were seen to be attached to the caryopses of this grass. The fungus occurred in a pasture where rivulets flowed across flat grassy areas partly covering the over-wintered caryopses in silt. Traditionally placed in the Sclerotiniaceae, this fungus has been excluded from that family in recent work (Holst-Jensen et al. 1997) and Eriksson (2006) placed it in Helotiales.

Habitat

On overwintered glumes and caryopses of *Deschampsia caespitosa*.

Material examined

South of Bakkasel Fnjóskadalur, S.-Þing., INa, 210 m, 28 Jul 2004, DHP (04-558 FH) and GGE (FA17849).

Distribution

This species is rarely collected in the Nordic countries (Hansen and Knudsen 2000) and elsewhere in the world. Judging by the phytopathological literature cited above, the fungus is probably widespread but rarely collected because of the small size of the apothecia.

Ombrophila violacea (Hedw.) Fr., Summa veg. Scand., Section Post. p. 357 (1849)

Basionym: *Octospora violacea* Hedw. Descr. micr.-anal. musc. frond. 2:27 (1789).

This species is not treated in the Nordic Macromycetes (Hansen and Knudsen 2000) but is reported from Denmark, Greenland and Norway in GBIF, based on herbarium records. It is distinctive in its clear violet color and in the gelatinous nature of the apothecial tissues. Gulden and Lange (1971) gave a description based on Norwegian material.

Habitat

On birch branch in stream.

Material examined

Vaðlaskógur woodland, Eyf., INa. Alt.: 40 m, 27 Jul 2004, DHP (04-553 FH) and GGE (FA17845).

Distribution

In the Nordic countries as noted above.

Pezizales

Melastiza flavorubens (Rehm) Pfister & Korf in Korf, Phytologia 21: 204 (1971)

Basionym: *Humaria flavorubens* Rehm, Rabenh. Krypt. Fl. ed. 2, 1(3): 960 (1894).

This species of *Melastiza* has not been reported previously from Iceland. On the otherhand, *M. cornubiensis* (Berk. & Broome) J. Moravec (= *M. chateri* (W. G. Smith) Boud.) has been reported from Iceland from several locations (Hallgrímsson and Eyjólfsdóttir 2004) and seems to be the most frequently encountered member of the genus in the Nordic countries. *M. cornubiensis* has irregularly reticulate spores; *M. flavorubens* has spores with warts that are frequently connected by low, narrow ridges. In all cases, accurate identification of these fungi requires microscopic examination.

Habitat

On sandy soil.

Material examined

Southern end of Lagarfljót (Lake Lögurinn), S.-Múl., IAU, 20–25 m, 31 Jul 2004, DHP (04-570 FH).

Distribution

Common in Denmark, rare in southeastern Norway (Hansen and Knudsen 2000).

Octospora leucoloma (Hedw.) Fr., Descr. micr.-anal. musc. frond. 2:13 (1789). – Fries, Syst. Mycol. 2: 71 (1822)

This species has not previously been reported from Iceland; it is associated as a rhizoidal parasite of *Bryum argenteum*, a common and widely distributed moss of disturbed areas. Our collection is the typical 8-spored form. Benkert (1998) considers a commonly recognized four spored-species, *Octospora tetraspora*, which occurs on the same moss, to be a variety of this species.

Habitat

In moss on soil.

Material examined

By river Hörgá Hörgárdalur, Eyf., INa, 10 m, 25 Jul 2004, DHP (04-543, 04-544 FH) and GGE.

Distribution

Common and rather widespread in the Nordic countries and in Greenland in hemiboreal and boreal areas (Hansen and Knudsen 2000, C from GBIF).

Octospora melina (Velen.) Dennis & Itzerott, Kew Bull. 28: 16 (1973)

Basionym: *Humaria melina* Velen., Monogr. Discomyc. Bohem. p. 325 (1934).

This species has not previously been reported in Iceland. It is characterized by having asci with eight ascospores, that are ellipsoid and ornamented with low, isolated warts. Only two species of *Octospora*, *O. axillaris* (Nees) M. M. Moser and *O. humosa* (Fr.) Dennis, have been reported from Iceland (Hansen and Knudsen 2000, Hallgrímsson and Eyjólfsdóttir 2004) but a third species is known, *O. rubens* (Boud.) M. M. Moser, from eastern Iceland collected in 1993 by H. Göttsche (C). The number of species in Iceland

is surely greater than these records indicate. In the Nordic countries, Hansen and Knudsen (2000) list more than 20 species. Detailed and focused collecting will undoubtedly reveal the presence of more species in Iceland.

Habitat

On sandy soil associated with mosses in areas that are periodically flooded.

Material examined

Staðarey-Kaupangshólmi in the river Eyjafjarðará, Eyf., INa, 0–2 m, 23 Jul 2004, GGE and DHP (04-526, 04-528 FH); Tvíhólmi in the river Eyjafjarðará, Eyf., INa, 0–2 m, 27 Jul 2004, GGE and DHP (04-552 FH).

Distribution

Known in Norway and in Finland where this species is of hemiboreal and perhaps boreal distribution (Hansen and Knudsen 2000).

Peziza Fr. sensu lato – general comments

Hansen et al. (2001, 2002, 2005) recently discussed relationships in the family Pezizaceae and the genus *Peziza*. The taxonomic implications of these studies are the subject of our on-going revisionary work. Revisions will certainly lead to a series of name changes and the realignment of taxa in the family. Few of the collections listed below have been adequately studied in fresh condition and therefore certain critical characters are lacking, such as hymenial color, production of colored juice, and general form. The following brief discussion should serve as a guide for future studies rather than be taken as a definitive statement regarding the diversity of these group.

Peziza apiculata Cooke, Mycographia, p. 175, pl. 79, Fig. 305 (1878)

This is the first report of a *Peziza* with apiculate spores in Iceland. It was collected on soil in plant beds. Generally *Peziza* species with apiculate spores are found on dead wood rather than soil. We do not have any indication of the hymenial color in this collection. Typically this species, and those presumably closely related to it, have greenish hymenia. Members of the *P. apiculata* group are not frequently collected and species delimitations remain difficult and debated (Hansen et al. 1998).

Habitat

On soil in plant beds.

Material examined

Fífilgerði Kaupangssveit, Eyf., INa, 60–80 m, 1 Sep 1988, Helgi Hallgrímsson (FA12050).

Distribution

There are only a few collections of *P. apiculata* noted in Scandinavia (Hansen and Knudsen 2000).

Peziza fimeti (Fuckel) Seaver, N. Am. Cup-fungi p. 232 (1928)

Basionym: *Humaria fimeti* Fuckel, Jahrb. Nassauischen Vereins Naturk. 25–26: 338 (1871).

Hansen et al. (2002) clarify the concept of this species. They point out that although reported in the literature with ascospores under 20 µm long, it is clear from type studies and from examining fresh collections, that the ascospores in this species are larger, ranging up to 22 µm. The material from Iceland has large spores as determined by Hallgrímsson and Gøtzsche (1990) and was properly referred to as *P. fimeti*. Hallgrímsson and Gøtzsche also included *P. granulosa* in their listing as a distinct species. Hansen et al. (2002) synonymized this species with *P. fimeti*.

Habitat

On dung and richly manured soil.

Material examined

Specimens examined are those listed by Hallgrímsson and Gøtzsche (1990:33) in addition to the following: FA15075, FA15076, FA15077, FA15078, FA15580, FA17261, FA17311.

Distribution

This species is known in the Nordic countries under both of the names cited above with varied frequency (Hansen and Knudsen 2000) but is probably widely distributed on herbivore dung.

Peziza limnaea Maas Geest., Persoonia 4: 422 (1967)

Synonym: *Galactinia castanea* var. *limosa* Grelet, Bull. Soc. Bot. Centre-Ouest 5: 166 (1936).

Gøtzsche (1987) pointed out under '*Peziza* 2' a fungus that was similar to *Peziza limnaea*. We have re-examined one of his collections and have made additional collections of what we consider to be the same taxon. This we interpret as *P. limnaea*. *Peziza limnaea* occurs in wet areas, produces dark brown to purplish fruitbodies with olivaceous flesh.

Ascospores are ornamented with ridges and interconnecting warts. This fits well in the collections described by Gøtzsche and those collected by us. As suggested by Gøtzsche, and others, this is a species that is quite variable and needs critical re-evaluation to resolve the complexity of taxa that may be represented under this name.

Habitat

On soil with moss along riverbank in an area that becomes inundated at high tide, and on flooded soil on riverbank.

Material examined

Staðarey-Kaupangshólmi in the river Eyjafjarðará, Eyf., INa, 0–2 m, 23 Jul 2004, DHP (04-522, 04-523 FH) and GGE (FA17833); Tvíhólmi in the river Eyjafjarðará, Eyf., INa, 0–2 m, 27 Jul 2004, DHP (04-550, 04-551) and GGE (FA17844).

Distribution

Peziza limnaea is widely reported in the Nordic countries, and in some areas it is found to be common (Hansen and Knudsen 2000; C, O in GBIF).

Peziza phyllogena Cooke, Mycographia p.148, Fig. 251 (1887)

Synonyms: *Peziza badioconfusa* Korf, Mycologia 46: 838 (1954) – *Aleuria olivacea* Boud., Bull. Soc. Mycol. France 13: 14 (1897).

This species is distinctive macroscopic in its violet tinted, somewhat tomentose ascomatal base and microscopic in its narrow ellipsoid finely warted ascospores. *P. kallioi* Harmaja, described from Finland and Sweden is considered by some to be a synonym (Hansen et al. 2001). In temperate regions it is often one of the earlier of the large species of *Peziza* to fruit.

Habitat

On mixture of soil and gravel in a tree bed in a park.

Material examined

Reykjavík, Laugardalur Park, Rvík, IVe, 5–15 m, 11 Sep 1998, GGE (FA17301).

Distribution

The species is known in the Nordic countries, occurring more frequently in high altitudes and latitudes (Hansen and Knudsen 2000).

***Peziza succosa* Berk., Ann. Mag. Nat. Hist. Ser. 1 6: 358 (1841)**

This is a first report of this fungus in the Iceland. It is one of the species of *Peziza* that exudes a yellow juice when damaged. *P. succosa* has larger spores (19–22 × 10–12 µm) than the other similarly colored species *P. succosella* (Le Gal & Romagn.) M. M. Moser ex Aviz.-Hersh. & Nemlich (16.5–19 × 8.5–10 µm).

Habitat

In a moist section of a path through woodland.

Material examined

Múlakot Fljótshlíð, Rang., ISu, 50 m, 23 Aug 1990, Helgi Hallgrímsson (FA12636).

Distribution

This species is common in the more temperate regions of the Nordic countries but it is rare in boreal areas (Hansen and Knudsen 2000). The locality where this specimen was collected is one of the warmest areas in Iceland and thus this temperate fungus might be expected.

***Peziza varia* (Hedw.) Fr., Syst. Mycol. 2: 61 (1822)**

Basionym: *Octospora varia* Hedw., Discr. micr.-anal. musc. frond. 2: 22 (1789).

Following the concept put forth by Hansen et al. (2001) *Peziza varia* is the most common and frequently encountered species of *Peziza* in Iceland. More than 25 collections were examined. As in other parts of the world, members of this group are often found growing in disturbed areas on highly decayed logs in forests and in areas impacted by humans, such as on mulched ground, cultivated fields, and building sites. In Iceland the species has a broad distribution and was even reported from concrete rubble in the central highlands.

Habitat

On woody substrates, wood chip and associated with building material.

Material examined

FA06583, FA08218, FA08510, FA09466, FA09886, FA10209, FA10769, FA10770, FA10775, FA10776, FA10782, FA10784, FA14563, FA14917, FA17019, FA17259, FA17260, FA17274, FA17286, FA17287, FA17354, FA17618, FA17623, FA17625, FA17658.

Distribution

Although listed in Hansen and Knudsen (2000) as occasionally collected given the more broad circumscription suggested by Hansen et al. (2001) which includes *P. cerea*, it is relatively frequently encountered.

Questionable report of *P. badia* based on Icelandic material

The specimens on which the previously recorded occurrences of *P. badia* in Iceland (Hallgrímsson and Gøtzsche 1990) was based were re-examined and found not to agree with the standard interpretation of this taxon. *Peziza badia* has reticulate or partially reticulate spores whereas the collections referred to under this name lack a reticulum. These collections have markings in the form of irregularly anastomosing ridges. The identity of these collections awaits a detailed study of living samples and the resolution of some of the questions surrounding the taxonomy of this group of species.

Habitat

On soil in churchyard and on soil in birch woodland.

Material examined

In Akureyri churchyard, Eyf., INa, 50 m, 2 Sep 1962, Helgi Hallgrímsson (FA10781); Egilsstaðaskógur woodland, S.-Múl., IAU, 40–60 m, 7 Aug 1993 (FA14967) and several other collections.

***Pseudombrophila theioleuca* Rolland, Bull. Soc. Mycol. Fr. 4: 57 (1888)**

No member of the genus *Pseudombrophila* has been reported in Iceland, this collection on dung was located in the herbarium under another name. Brummelen (1995) states that this species is one of the most commonly encountered and seems rather indiscriminant regarding the specific type of dung on which it grows. Brummelen also points out that so far as is known the genus *Pseudombrophila* shows a boreal pattern of distribution.

Habitat

On dung in a gravelly rivercourse.

Material examined

Krossáraurar north of mountain Göltur in Þórsmörk, Rang., ISu, 300 m, 4 Jul 1979, Hörður Kristinsson (FA45260).

Distribution

This species is occasionally collected in Norway, Sweden and Denmark but is thought to be rare in Finland (Hansen and Knudsen 2000). Brummelen (1995) records specimens from all the Nordic countries.

Pulvinula convexella (P. Karst.) Pfister, Occas. Pap. Farlow Herb. Crypt. Bot. 9: 9 (1976)

Basionym: *Peziza convexella* P. Karst., Monogr. Peziz. fenn. p. 10 (1869).

This is a widespread and frequently encountered taxon on sandy soil in Iceland. It is the only *Pulvinula* species that has been reported from Iceland. Dissing (cited in Hansen and Knudsen 2000) points out that the distinction between *P. constellatio* and *P. convexella* is not clear and distinguishes the species primarily on the basis of ecology. *P. constellatio* is said to occur on rich earth, brunt ground and limestone while *P. convexella* is characterized as occurring on sandy soil in moist areas. Pfister (1976) synonymized these two under the name *P. convexella*. In what ever way the final deliberations on the circumscription of these species might be resolved, the collection recorded here fall in to *P. convexella* as defined by Dissing as well as the broad circumscription of it accepted by Pfister (1976).

Habitat

On soil with mosses on sandy riverbanks, and in area along rivers that become inundated.

Material examined

Staðarey-Kaupangshólmi in river Eyjafjarðará, Eyf., INa, 0–2 m, 23 Jul 2004, DHP (04-525, 04-527, 04-529 FH) and GGE (FA17835); The river Eyjafjarðará, Eyf., INa, 0–2 m, 23 Jul 2004, DHP (04-531a) and GGE (FA13876); The river Hörgá Hörgárdalur, Eyf., INa, 10 m, 25 Jul 2004, DHP (04-545) and GGE (FA17843); Tvíhólmi in the river Eyjafjarðará, Eyf., INa, 0–2 m, 27 Jul 2004, DHP (04-547 FH) and GGE; The southern end of Lagarfljót (Lake Lögurinn), S.-Múl., IAu, 20–25 m, 31 Jul 2004, DHP (04-570 FH).

Distribution

This species is common in the Nordic countries (Hansen and Knudsen 2000) and in Greenland (GBIF record).

Ramsbottomia macracantha (Boud.) Benkert & T. Schumach. *Agarica* 6: 37 (1985)

Basionym: *Lamprospora crechqueraultii* var. *macracantha* Boud., Hist. class. Discomycètes d'Europe. p. 69 (1907).

Ramsbottomia macracantha has not previously been reported from Iceland. The three species of *Ramsbottomia* reported in the Nordic countries, *R. asperior* (Nyl.) Benkert & T. Schumach., *R. crechqueraultii* (P. Crouan & H. Crouan) Benkert & T. Schumach., and *R. macracantha*, differ in the shape of the ascospores (subglobose or globose) and the height of the spines on the surface of the ascospores. *R. macracantha* has globose ascospores ornamented with spines that reach up to 6 µm in length distinguishing it from *R. crechqueraultii*, which has shorter spines. *R. asperior*, with subglobose spores, is one of the most frequently encountered soil inhabiting discomycetes we found in Iceland. It often occurs in great numbers on trail sides and disturbed sites. To further document the occurrence of *R. crechqueraultii*, which is reported in Iceland (Hallgrímsson and Eyjólfsdóttir 2004), we add a further specimen for the record (on trail in Egilsstaðaskógur woods near Egilsstaðir, along river, S.-Múl., IAu, 60–70 m, 30 Jul 2004, DHP (04-565b FH)).

Habitat

On soil amongst mosses.

Material examined

Hlíðarfjall Akureyri, at Sellækur stream near ski hotel, Eyf., INa, 520–530 m, 21 Jul 2004, DHP (04-515 FH) and GGE (FA17686); Varpholt Glæsibæjarhreppi, Eyf., INa, 20–30 m, 25 Jul 2004, DHP (04-540 FH).

Distribution

In the Nordic countries this species is rarely recorded or is not often determined (Hansen and Knudsen 2000).

Tarzettia cupularis (L.: Fr.) Lambotte, Mem. Soc. R. Sci. Liège, Ser. 2 14: 325 (1888)

Basionym: *Peziza cupularis* L., Sp. plantarum 2: 1181 (1753).

Tarzettia cupularis is reported in the early literature as summarized by Hallgrímsson and Eyjólfsdóttir (2004) but its presence in the country has not been well documented. The collections cited here are referred to this species based on morphological studies. It is not clear that *T. cupularis* and *T. catinus* (Holmsk.: Fr.) Korf & J. K. Rogers can be distinguished, they have spores that fall in the same size range and the major difference is whether the apothecia are stipitate or substipitate. *T. cupularis* is distinguished from *T. catinus* by the presence of a stipe. The apothecia of *T. catinus* also have the tendency to split at maturity. We find that the Icelandic material could be referred to either *T. cupularis* (FA09270, FA10773) or *T. catinus* (FA09694 a/b). In these collections the paraphyses are straight and unbranched, as opposed to the situation in *T. spurcata* (Pers.) Harmaja in which the paraphyses become highly

branched in the upper 1/4 of their length. *Tarzetta spurcata* is the only species of this genus currently listed as occurring in Iceland (Hansen and Knudsen 2000). Hallgrímsson and Göttsche (1990) mention the deviation in morphology exhibited among the Icelandic collections they studied. We use the name *T. spurcata* for the taxon with highly branched paraphyses and the other taxon is referred to *T. cupularis*.

Habitat

On soil often with mosses, in stands of trees.

Material examined

Akureyri, Hestklettur, Eyf., INa, 50 m, 30 Jul 1985, Helgi Hallgrímsson (FA09694); Akureyri, Eyf., INa, 50 m, 04 Jul 1981, Helgi Hallgrímsson (FA09270); Droplaugarstaðir Fljótsdal, N.-Múl., IAu, 70 m, 8 Sep 1961, Helgi Hallgrímsson (FA10773).

Distribution

This species and collections referred to *T. catinus* are common and wide spread in the more temperate regions of the Nordic countries (Hansen and Knudsen 2000).

Trichophaea hybrida (Sowerby) T. Schumach., Mycotaxon 33: 166 (1988)

Basionym: *Peziza hybrida* Sowerby, Col. fig. Engl. fungi, tab. 369, Fig. 1 (1803).

This fungus is noteworthy because of its recent implication in the formation of ectotrophic mycorrhizae with conifers (Tedersoo et al. 2006). Dissing in Hansen and Knudsen (2000) points out that the taxonomy of this species is far from clear. In older literature it is known under the name *T. gregaria* (Rehm) Boud. with forms and varieties: *T. gregaria* forma *laevispora* Korf & Gruff, *T. gregaria* var. *intermedia* Le Gal. It is likely that this is a species complex and that further study will clarify the taxonomy of these fungi. Eyjólfssdóttir (2007) reports this species from a larch plantation.

Habitat

On bare soil and on plant material. It occurs in troops often on vertically exposed soil cuts and seems to be associated with conifers.

Material examined

Kjarnaskógur woodland Akureyri, course of stream Brunná, Eyf., INa, 60 m, 27 Jul 2004, DHP (04-556 FH) and GGE (FA17848); Trail Ljósárkinn, Hallormsstaðaskógur woodland, S.-Múl., IAu, 80–120 m, 31 Jul 2004, DHP (04-585a FH); Mjóanes Fljótsdalshérað, S.-Múl., IAu, 20–40 m, 14 Aug 2003, GGE (FA17491).

Distribution

This species is widely distributed in the Nordic countries (Hansen and Knudsen 2000).

Acknowledgements – Donald H. Pfister wishes to thank the Icelandic Inst. of Nat. Hist., Akureyri for providing working facilities, and Halldór G. Pétursson, of the Institute, for his help in navigating the Icelandic terrain.

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