

# Join *Hypomyces* sampling campaign!



## Project FunDive

In FunDive we work towards putting fungal diversity on the map to enhance European conservation efforts. Fungi are essential for our ecosystems but have often been neglected in monitoring efforts and conservation practices, leaving them vulnerable to threats and habitat loss. We would like to engage you to change this.



For more information, please visit <https://fun-dive.eu/>

FunDive is a pan-European initiative funded by Biodiversa+ that brings together 33 partners in 22 countries to improve fungal monitoring across the continent. The goal of FunDive is to close the knowledge gap dealing with fungal distributions to improve fungal conservation using the help from you and other citizen scientists.

### Why is fungal monitoring important?

Fungi are generally under-studied. Their global distribution patterns are poorly resolved. Also in Europe, despite centuries of fungal research, there is a lack of the distribution patterns of many fungal species. However, this knowledge is very important for effective conservation practices. For example, assessments of species for the IUCN Red List require an understanding of the distribution of said species.

### What can you do?

FunDive is structured in different projects, each focusing on a specific target group of fungi. You can engage in each project by documenting and collecting fungal specimens. The process is simple:

- find a representative of a target species from project list: <https://fun-dive.eu/get-involved/current-projects/>
- make a photo and record your specimen in PlutofGO app <https://plutof.ut.ee/go> following our instructions <https://fun-dive.eu/get-involved/how-to-engage/>
- send it to your national point of contact <https://fun-dive.eu/get-involved/fundive-national-points-of-contact/>
- your specimen will be processed and identified based on molecular information
- you can follow your fungus on FunDive records: <https://fun-dive.eu/dataportal/>.

For more information on how to document your records, please visit <https://fun-dive.eu/get-involved/how-to-engage/>



## *Hypomyces* s.l. on mushrooms

are among the targets of the 2025 FunDive campaigns  
to clarify host and distribution range of species infecting annual fungal sporomata

***Hypomyces* (Fr.) Tul. & C. Tul.** along with several closely related genera in the family Hypocreaceae constitute the largest and most conspicuous group of ascomycetes growing exclusively on sporomata (=fruitbodies) of fungi. Their life cycle includes sexual and/or asexual stage, according to which the species have been described in several teleomorph- and anamorph-typified genera, respectively. The majority of species produce cottony mycelium forming conidiophores bearing conidiogenous cells from which a single or multiple conidia arise. The morphologically variable anamorphs are often accompanied by thick-walled chlamydospores or aleuriospores of different colour and aggregation characteristic of each species/group. Such mycelium can turn into subiculum in which perithecia, producing typically fusiform one-septate ascospores with apiculi at both ends, are formed.

*Hypomyces* infections are generally easy to recognize as the host mushrooms become 'moldy', i.e. covered by whitish mycelium that may turn into various colours, depending on the parasite species. In case of biotrophic parasites, the infection is apparent in already emerging sporomata accompanied by abnormal or restricted growth of the host that can remain of smaller size and distorted compared to the intact sporomata. By contrast, necrotrophic parasites cause the decay of the host that can end in the whole sporomata becoming destroyed.

Habitats of *Hypomyces* s.l. are as diverse as their host taxa. The highest diversity has been encountered on polypores – a group that will not be included in this campaign (yet we welcome all material the participants spot and are willing to collect and send us). Mushrooms infected by *Hypomyces* mostly grow in forests of various types. As majority of such hosts form ectomycorrhizae, their distribution is determined by that of their tree symbiont. Species parasitizing on members of Geoglossaceae can be found in grasslands.

This campaign focuses on *Hypomyces* s.l. growing on mushrooms including agarics and boletes but also macroscopic sporomata of ascomycetes, and one species on lichen thalli. These include both rarely and widely reported species, the latter often designating a complex, while using epithet of the first described or most well-known species. Yet, such groups can embed several species, each specialised to particular hosts. Knowledge on hosts is often based on visual examination of uninfected (parts) of sporomata (nearby) that can lead to misidentifications. FunDive campaign results are expected to aid in improving the host range concepts of *Hypomyces* s.l. by obtaining material across Europe and exploiting the advancements of methodologies, suited to simultaneously sequence and identify fungicolous fungi and their macrofungal hosts using the fungal DNA barcode (ITS rDNA).

Most of the records of *Hypomyces* s. l. occurring on mushrooms in Europe available in public databases originate from Northern Europe. Therefore, we are particularly calling for sampling in the more southern and western regions of Europe to clarify distribution and hosts of *Hypomyces* s.l. there. Rare or cryptic/overlooked species are expected to be searched for across Europe.

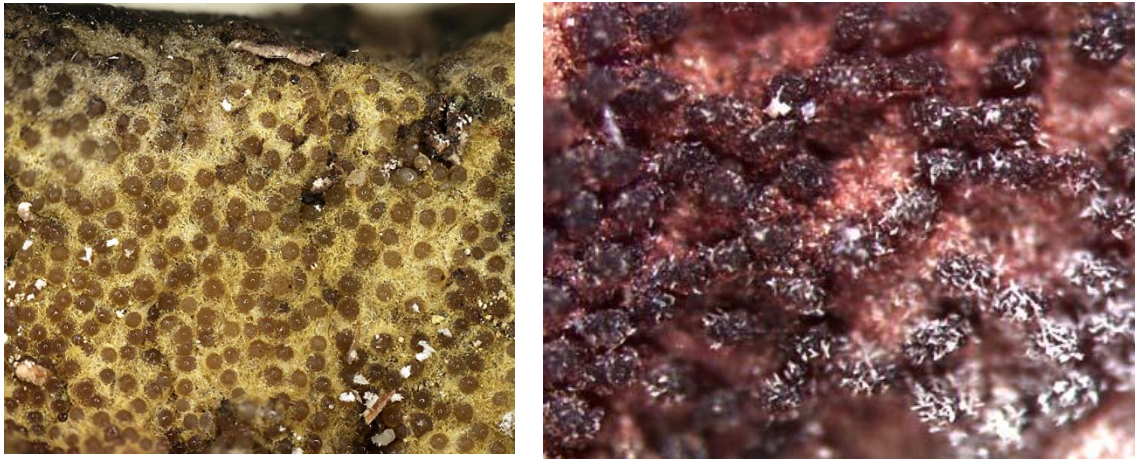
This booklet introduces 26 species found in Europe that are grouped according to their host range, morphology and lifestyle. One of the most common species on mushrooms, *H. ochraceus*, is not included in the campaign, meaning we ask not to collect basidiomata of *Lactarius* and *Russula* that become embedded in whitish fluffy cottony mycelium (see further details under *Blastotrichum puccinioides*), unless you find the teleomorph nearby the vanished host. Likewise, the boletes can become heavily infested by the *Sepedonium* anamorphs and therefore, please do not collect more than one infected basidioma from one spot unless you consider the host taxa to be different.

**By collecting infected mushrooms you will provide valuable material for analysing host specialization and distribution of as well as for detecting yet undescribed species of *Hypomyces s.l.* in Europe.**

## Morphological characterisation of *Hypomyces*

### – teleomorphs

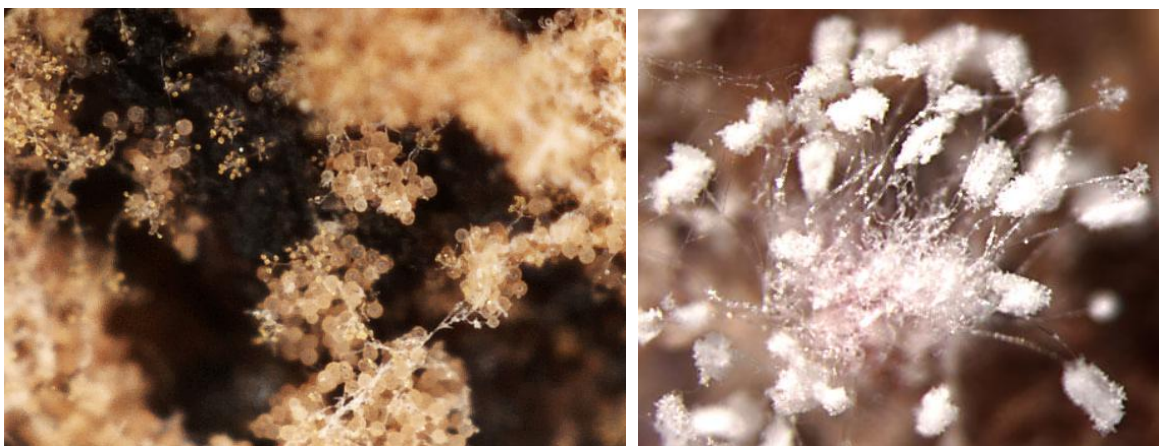
Most species form subiculum – a form of mycelium in which the sexual reproduction occurs, resulting in the formation of perithecia. The perithecia are subglobose to obpyriform or flask-shaped with a low or elongated papilla from the top of which ripe asci are extruded. Each cylindrical ascus contains eight ascospores that are fusiform, naviculate or lanceolate, with one median or submedian septum and a verrucose or tuberculate wall, both ends bear appendages called apiculi.



**Fig. 1. Subiculum with perithecia and extruded ascospores (white worm-like agglomerations). On the left *H. luteovirens*, on the right *H. rosellus* (photos Kadri Põldmaa).**

### – anamorphs

The asexual reproductive structures vary to a much larger extent and are characterised below for each species (group). For microscopic characterisation of species outlined below, it is advised to consult literature sources listed under the references.



**Fig. 2. *Mycogone rosea* - aleuriospores together with a conidial synanamorph (on the left). *Hypomyces odoratus* - conidiophores bearing conidiogenous cells and conidia held in long imbricate chains (on the right, photos Kadri Põldmaa).**

## How to collect and record data on *Hypomyces* s.l. specimens?

In order to unequivocally identify the host associations of *Hypomyces* s.l. species we aim to extract DNA from infected sporomata and identify both partners from resulting sequences. Therefore, all findings (except for those of *H. armeniacus*/*H. ochraceus* and more than one collection on boletes from one spot) need to be **collected**, dried and sent to the country level points of contact. It is critical to **pack each specimen individually** (e.g in paper bag or piece of foil) already in the field as most contain high amounts of conidia that are dispersed by air and can easily contaminate other collections.

The **data and photos** for each collection need to be recorded using **PlutoF GO** or equivalent biodiversity recording app. The general procedures for doing that are outlined at the FunDive webpage: <https://fun.dive.eu/en/get-involved/how-to-engage/>.

You are welcome to add species level identification or a guess on its identity at the taxon field but the genus name, indication of a potential host and photos) are sufficient for processing the collections and their records in the database. For **recording info on the host** of your *Hypomyces* s.l. specimens in PlutoF GO:

- use the **'Interacting taxon'** by choosing the name of the fungal species, genus or higher level taxon (and host under '*Interaction type*').

- **'Interaction remarks'** field can be used for specifying host characteristics, also in case nothing can be guessed on hosts identity (in such case you still have to fill in the '*Interacting taxon*' field e.g. either by choosing Fungi, Agaricomycetes etc.). A note can be added on the identity of nearby intact sporomata that could represent potential hosts in case these are totally distorted/covered by the parasite.

- The substrate of the host fungus can be indicated by picking the best choice at the '*Substrate type*' field or inserting it as free text at the '*Substrate remarks*' field.

Characterizing the habitat type on the '*Habitat description*' field and a photo of the site is beneficial, yet optional.

In case of using another application, record the same info using constant data fields to facilitate sorting data upon later import to PlutoF.

When taking **photos** try to capture both the parasite and the host. In case uninfected sporomata are spotted nearby (and photographed separately), indicate their distance from the infected ones at '*Interaction remarks*'.

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## 1. Species on Russulaceae

### *Hypomyces lateritius* (Fr.) Tul. & C.Tul.

Whitish to buff subiculum with gregarious amber to ochraceous perithecia covering the whole hymenophore of the host.

Hosts: species of the *Lactarius deliciosus*-group (*L. deliciosus*, *L. deterrimus*, *L. sanguifluus*,?). A morphologically similar *Hypomyces* grows on a distinct group or *Lactarius* (*L. uvidus*, *L. vietus*) that warrants further investigations based on additional collections to be obtained.



Fig. 3. On top *H. lateritius* on *Lactarius deliciosus* (photo Vello Liiv), at the bottom *Hypomyces* sp. on *L. uvidus* (photo Kadri Põldmaa).

***Hypomyces lithuanicus* Heinr.-Norm.**

(known also as *H. torminosus* or *H. spadiceus*)

The species is mostly recorded in the form of its teleomorph – brownish perithecia formed in ochraceous to cinnamon-colored subiculum that eventually covers the whole gill layer of the host. However, it starts to grow as whitish mycelium on which simple unbranched conidiophores bearing droplets of hyaline aseptate conidia are formed. Soon the mycelium develops into subiculum with perithecia that differ from those of its sibling, *H. lateritius* by darker, brownish colouration and the perithecial papilla turning pale purplish in aqueous KOH solution.

Hosts: on species of the *Lactarius torminosus*-group, reported on *L. pubescens* and *L. torminosus*



**Fig. 4. *H. lithuanicus*. Whitish anamorph at margins developing into subiculum with brick-brownish perithecia (photo Kadri Pöldmaa)**

***Hypomyces luteovirens* (Fr.) Tul. & C. Tul.**

Green subiculum with aggregated green to blackish perithecia cover the whole hymenophore, sometimes also the upper cap surface and the stipe of the host that often does not grow to its full size and is thus impossible to recognize. The host data is usually based on a guess on nearby *Russula* basidiomata which yet might belong to another species. Sequencing of the infected hosts from Northern Europe has shown several *Russula* species being infected but material is needed from western and southern Europe to understand the full host range.



**Fig. 5. *H. luteovirens*. Upper photo on *Russula* sp. ( Jukka Vauras), lower on *R. atrorubens* (Per Marstad).**

***Blastotrichum puccinioides* Preuss (= *Cladobotryum apiculatum* (Tubaki) W.Gams & Hooz.)**

Fluffy cottony whitish mycelium growing over parts of the host basidioma. Verticillately branched conidiophores bearing elongated obpyriform hyaline conidia, held at their bases by 1-3 at the apex of the conidiogenous cell. The species is easily recognized due to the production of dark brown warted chlamydospores that are arranged by on top of each other, that can be seen by hand lens or under a stereomicroscope.

The sibling species, *H. ochraceous* (known also as *H. armeniacus* or by its anamorph name *Cladobotryum verticillioides*) forms similar conidiophores but the conidia are much shorter and wider and the chlamydospores hyaline to ochraceous, smooth-walled. The anamorph is very common on many species of *Lactarius* and *Russula* and should not be sampled during the current campaign!



**Fig. 6 the anamorph of *Hypomyces ochraceus* on *Russula* sp. not to be collected during this campaign (photos Kadri Põldmaa)**

Hosts: *Russula delica* and other *Russula* species with large white fruitbodies or broader host range?

## 2. Species on Agaricales, Russulales and Gomphales

### 2a. *Hypomyces* species with *Cladobotryum* anamorphs on ectomycorrhizal members of Agaricales and Russulales

There are several species of *Hypomyces/Cladobotryum* that are found on basidiomata of mushrooms (and polypores) from various taxa of Agaricomycetes that form *Cladobotryum* anamorphs and, if reproducing also sexually, red perithecia in whitish to pinkish subiculum. Such species are found as fluffy, whitish mycelium on different parts of the basidioma that eventually become decayed by the parasite. Subiculum with perithecia sometimes develops on the substratum of the host nearby (or on the host in case of polypores).

The anamorphs of *H. odoratus* and *H. rosellus* are rather common, at least in northern Europe, with much less records available for other species. The complex also includes undescribed species (Milic et al 2022, Tamm & Põldmaa 2013) warranting further collection of the group on different mushroom taxa. However, it is difficult to distinguish between these species in the field, and also not from *H. ochraceous* in case the host is a *Lactarius* or *Russula*. As the latter species can be extremely abundant, avoid collecting the white fluffy mycelium on these two host genera (see further under *B. puccinioides*).

#### *H. rosellus* (Alb. & Schwein.) Tul. & C. Tul.

Teleomorph forming on the ground, branches or polypores, anamorph also common on agarics. This was the first of the *Hypomyces* species with red-coloured perithecia described and the epithet has been applied to many species later distinguished in the group that incorporates also many only asexually reproducing species described in the genus *Cladobotryum* or yet undescribed (Milic et al 2022, Tamm & Põldmaa 2013).

Hosts: species of *Agaricus*, *Armillaria*, *Cortinarius*, *Inocybe*, *Lactarius*, *Melanoleuca*, *Pluteus*, *Russula*, *Tricholoma*.



Fig. 7. *H. rosellus*. On the left anamorph on *Armillaria* basidiomata, on the right teleomorph with pinkish subiculum on wood, mosses and debris underneath (photos Kadri Põldmaa).

***H. odoratus* G.R.W. Arnold**

Anamorph very common, teleomorph obtained only by crossing strains in pure culture.

Hosts (among agarics): *Agaricus*, *Armillaria*, *Inocybe*, *Lactarius*, *Megacollybia*, *Microompale*, *Russula*.



**Fig. 8.** *H. odoratus* anamorph on *Cortinarius* sp. (photos Kadri Põldmaa)

***C. rubrobrunnescens* Helfer**

Known only as an anamorph from a few locations in Estonia, Denmark and Germany. One teleomorph collection on bark of *Quercus suber* from Spain.



**Fig. 9.** *C. rubrobrunnescens* on decaying basidioma of *Inocybe erubescens* and on the ground under vanished host (photo Kadri Põldmaa).

Hosts: *Inocybe* spp. (and *Cortinarius*?)

***C. tenue* Helfer**

Known only as an anamorph from a few collections.

Hosts: species of *Lactarius*, *Russula*, *Tricholoma*.

## 2b. *Hypomyces porphyreus* Rogerson & Mazzer

Brownish perithecia embedded in whitish to brick-reddish subiculum covering the host cap, that remains unexpanded and totally covered by the parasite that extends its hyphae also over the host stipe. Recorded from Estonia, Denmark, Netherlands, Norway and Sweden.

Hosts: *Entoloma* sp., *E. (=Leptonia) strigosissimum*



**Fig. 10.** *H. porphyreus* in the field (photo by Erik Arnfred Thomsen), on the right hand side a close up showing the unexpanded host cap totally covered with subiculum and perithecia of the parasite (Kadri Põldmaa).

## 2c. Species of *Mycogone* Link

The species are known as anamorphs on various members of the Agaricales or *Ramaria* spp. (Gomphales) and one on *Helvella* spp. (*M. cervina*, described under 'species on ascomycetes'). They develop a creamish to buff mycelium that gradually turns ochraceous or salmon-coloured to roseous when forming aleuriospores. These are composed of a globose thick-walled and grossly warted cell on a subglobose thin-walled and hyaline supporting cell.

***M. rosea* Link** is common in forest and parks, especially on basidiomata of *Amanita*, *Inocybe*, but also on *Cortinarius*, *Tricholoma*, *Entoloma* and other genera.

***M. perniciosa* Magnus ex Delacr.** is a common parasite of cultivated mushrooms, causing wet bubble disease of the white button mushrooms (*Agaricus bisporus*), shiitake (*Lentinula edodes*) and oyster (*Pleurotus* spp.) mushrooms. Distribution and host range in nature need to be clarified.



Fig. 11. *Mycogone rosea* on *Amanita muscaria* (on the left), aleuriospores on the right.

***M. calospora* (P. Karst.) Höhn.**

Whitish mycelium developing on the host that turns grayish and decomposes.

Hosts: *Ramaria decolorans*, *Ramaria* sp.



**Fig. 12. *Mycogone calospora* on *Ramaria* sp. (photo Kåre Homble).**

## 2d. Species on saprotrophic Agaricales

Species in this group develop a whitish to ochraceous mycelium that grows over host basidiomata, forming verticillately branched conidiophores that bear conidia in watery droplets. The mycelium may turn into a concolorous subiculum in which pale brownish perithecia are formed.

### *H. tremellicola* (Ellis & Everh.) Rogerson

### *H. gamsii* Crous & Akulov

Hosts: *Crepidotus* spp. (in both species). Morphologically very similar *H. subglobosus* and undescribed species have also been recorded on *Crepidotus*, warranting additional sampling of infected sporomata of this host genus.



Fig. 13. *Hypomyces gamsii*. On the left anamorph on decayed *Crepidotus* sp., perithecia with extruded ascospores on the right (photos Kadri Põldmaa).

### *H. tubariicola* (W. Gams) Zare & W. Gams

Hosts: *Tubaria furfuracea* (and *Psathyrella* and other agarics?)



Fig. 14. *Hypomyces tubariicola* on *Tubaria furfuracea* (photo Tobias Bøllingtoft).

## 4. Species on Boletales

All species in this group start out with cottony whitish mycelium that bears verticillately branching conidiophores that form aseptate ellipsoidal conidia held in liquid droplets at the tips of conidiogenous cells. Soon the mycelium becomes yellowish due to the formation of yellow aleuriospores on the same mycelium. These are (sub)globose or ellipsoidal and (in *H. tulasneanus*), thick-walled and verrucose/tuberculate.

The same mycelium that produces the anamorph can turn into a compact subiculum in which the sexual reproduction occurs, resulting in the formation of perithecia. These are subglobose to flask-shaped with a low or elongated papilla from which ripe asci are extruded. Each cylindrical ascus contains eight ascospores that are fusiform to naviculate or lanceolate, 1-septate; the wall is verrucose and both ends bear short appendages (apiculi).

### *Hypomyces chrysospermus* Tul. & C. Tul.

The species is common on various bolete taxa but as the epithet has been applied also for collections of several other boleticolous *Hypomyces/Sepedonium*, the host range of this species and potential inclusion of cryptic species still needs to be elucidated. Collections including the telomorph are especially welcome.



**Fig. 15.** *Hypomyces chrysospermus* on a decayed sporomata of *Boletus aestivalis* (upper row), on the left hand side *Sepedonium* anamorph, in the center right perithecia formed in subiculum on the upper part of the stipe and hymenophore, zoomed in on the right hand side image. In lower row infection on *Paxillus* sp. (photos Kadri Põldmaa).

***H. microspermus* Rogerson & Samuels**

The species is very similar to *H. chrysospermus* but can be distinguished by reddish perithecia which can however be also buff to brown as in the very similar *H. chrysospermus*. The reddish pigments, if present, turn purple in aqueous KOH solution.

Hosts: earlier described as *Xerocomus chrysenteron*-group (reported on *X. chrysenteron*, *X. porosporus*). Considering current taxonomy, its possible specialisation to *Xerocomellus* needs to be verified.

***H. tulasneanus* Plowr.**

The only representative of boleticolous *Hypomyces/Sepedonium* in Europe that does not form yellowish pigments and has elongate to spindle-shaped, mostly hyaline aleurioconidia. The whitish to buff mycelium bearing the anamorph structures can eventually turn partly or totally into subiculum on which brownish perithecia are produced.

Hosts: common on *Suillellus luridus*, recorded also on *S. rhodoxanthus* but does it infect also other species of *Suillellus* (including several growing in southern Europe)?



**Fig. 16. *H. tulasneanus* on *Suillellus luridus*. On the left anamorph covering host basidoma, on the right perithecia developing among the anamorph (photo Kadri Põldmaa).**

***Sepedonium ampullosporum* Damon** recorded on *Caloboletus radicans*, *Rubroboletus satanas*, *Gomphidius glutinosus*, *Gyroporus cyanescens*, *Melanogaster ambiguus*. *M. broomeianus*.

***Sepedonium chalcipori* Helfer** on *Chalciporus piperatus*

***Sepedonium chlorinum* (Tul. & C. Tul.) Damon** recorded on *Neoboletus erythropus* from Germany and several bolete genera in France. Occurs in various regions of the world but distribution and host range in Europe (no records in GBIF) need to be clarified.

***Sepedonium laevigatum* Sahr & Ammer** recorded mostly on species of *Leccinum* but also on *Boletus*, *Gomphidius*, *Gyrodon*.

## 5. species on ascomycetes, including lichenised hosts

### *Hypomyces leotiicola* Rogerson & Samuels

First pale buff later bluish-green to black perithecia immersed in host tissue or whitish mycelium on host hymenium, less frequently on stipe. Accompanied by a verticillium-like anamorph and globose unicellular pale-greenish aleuriospores. Recorded from Belgium, Denmark, Finland, France, Netherlands, Norway and Sweden. The infection is hard to recognize in the field as the parasite cannot easily be distinguished from the often wet host ascomata.

Hosts: *Leotia* (*L. lubrica*, ?).



Fig. 17. *Hypomyces leotiicola* (photos Thomas Kehlet, Tove Hafnor Dahl).

### *Hypomyces papulasporae* Rogerson & Samuels

Whitish mycelium covering the fertile part of the ascomata, often extending also downwards, producing a conidial anamorph accompanied by *Papulaspora*-kind of multicellular aleuriospores. Hyaline to pale yellow perithecia formed on the same mycelium, not recorded from Europe?

Hosts: species of *Geoglossum*, *Trichoglossum*



Fig. 18. *Hypomyces papulasporae* (photo Maricel Patino).

***Stephanoma tetracoccum* Zindern-Bakker**

The species is very similar to *H. papulasporae* in its appearance forming whitish mycelium on host ascomata. It differs, however in the morphology of both synanamorphs, in particular by producing warted aleuriospores with 2-3 smaller cells attached to one large cell. Grows like previous species on geoglossaceous hosts in natural grasslands, recorded from Denmark, Germany, Netherlands and Sweden.

Hosts: Geoglossaceae, not identified at species level.



Fig. 19. *Stephanoma tetracoccum* (photo Dan Hua Wang).

***Mycogone cervina* Ditmar**

The anamorph covers whole ascomata of the host, starting white and turning roseous upon the maturation of aleuriospores (see under *Mycogone* above). The species is very common on *Helvella* spp., therefore, if the host can be identified in the field, observation of the along with a photo is sufficient to document the occurrence of this species.

***Hypomyces peltigericola* Lechat & Gardiennet**

Bright red to crimson perithecia immersed in whitish to pale yellowish to crimson subiculum. Typical *Cladobotryum* anamorph formed from germinated ascospores in culture. This is the only lichenicolous species of *Hypomyces*. It is known only from the type specimen, collected on thallus of *Peltigera canina* in Côte-d'Or, Salmaise, Ermitage Saint-Jean de Bonnevaux, France. Additional collections are very much appreciated to know more about its host and distribution range. Thalli of the upmentioned lichen species/genus would be the first targets in the search for this *Hypomyces* species.



**Fig. 20. *Hypomyces peltigericola* from the original description in Lechat et al 2017**

**Additional information and identification keys:**

LECHAT C, GARDIENNET A, FOURNIER J. 2017. First report of a lichenicolous species of *Hypomyces* (Hypocreaceae), *H. peltigericola* sp. nov. *Ascomycete.org*, 9 (2): 23-26.

MILIC N, CHRISTINAKI AC, BENAKI D, STAVROU AA, TSAFANTAKIS N, FOKIALAKIS N, KOUVELIS VN, GONOU-ZAGOU Z. Polyphasic Systematics of the Fungicolous Genus *Cladobotryum* Based on Morphological, Molecular and Metabolomics Data. *Journal of Fungi*. 2022; 8(8):877. <https://doi.org/10.3390/jof8080877>

ROGERSON CT & SAMUELS GJ. 1985. Species of *Hypomyces* and *Nectria* occurring on Discomycetes. *Mycologia*, 77 (5): 763-783.

ROGERSON CT & SAMUELS GJ. 1989. Boleticolous Species of *Hypomyces*. *Mycologia*, 81 (3): 413-432.

ROGERSON CT & SAMUELS GJ. 1994. Agaricolous species of *Hypomyces*. *Mycologia*, 86 (6): 839-866.

SAHR T, AMMER H, BESL H, FISCHER M. 1999. Infrageneric classification of the boleticolous genus *Sepedonium*: species delimitation and phylogenetic relationships: species delimitation and phylogenetic relationships, *Mycologia*, 91 (6): 935-943. DOI: 10.1080/00275514.1999.12061104

TAMM H. & PÖLDMAA K. 2013. Diversity, host associations, and phylogeography of temperate aurofusarin-producing *Hypomyces/Cladobotryum* including causal agents of cobweb disease of cultivated mushrooms. *Fungal Biology*, 117 (5): 348-367. <http://dx.doi.org/10.1016/j.funbio.2013.03.005>

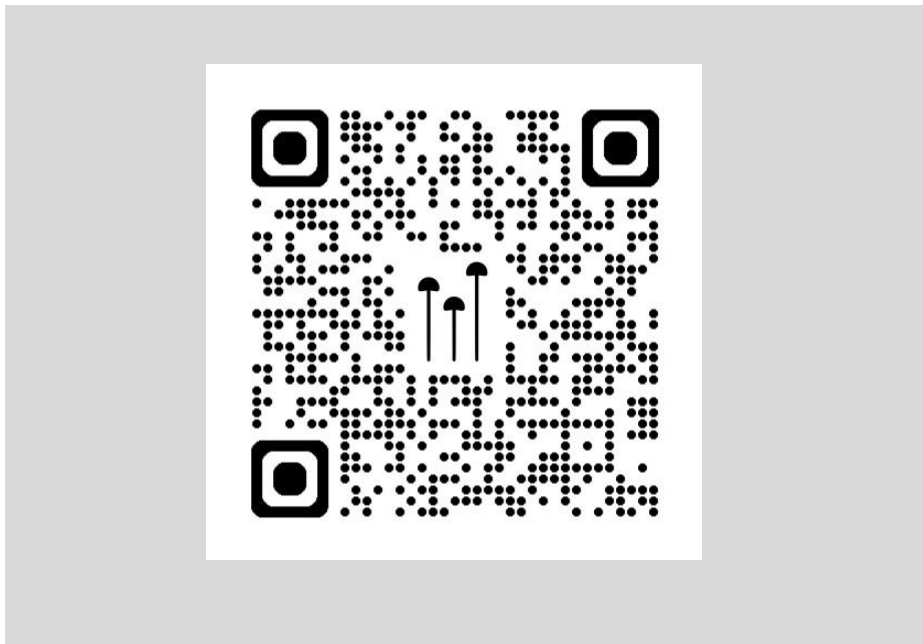
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Photo on the front cover: *Hypomyces odoratus* on *Inocybe leucoblema* (Kadri Põldmaa)

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