

INTERIM REPORT

Mires of Bosnia and Herzegovina - Important and Fragile Habitat Types and Refugium for Boreal and Circumboreal Fungal Species



MIKOLOŠKO UDRUŽENJE MYCOBH
Mycological Society MYCOBH

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Field Research and Results

From the beginning of the project implementation until end of April 2024, we have completed 17 mycology field researches on four main peatland sites in Bosnia and Herzegovina (Protected Landscape Bijambare, Đilda`s peatland – Mt. Zvijezda, Han Kram peatland – Han Pijesak and Jezerca peatland – Mt. Vranica). Field research have been organized in almost every month during project duration except December and January due to the low temperature, snow and frost at the peatland sites.

No	Date	Peatland site	Locality
1	17.04.2023.	Đilda`s peatland	Mt. Zvijezda
2	04.05.2023.	Duga/Slana bara	Bijambare PL
3	06.05.2023.	Duga/Slana bara	Bijambare PL
4	20.05.2023.	Duga/Slana bara	Bijambare PL
5	04.06.2023.	Duga/Slana bara	Bijambare PL
6	29.06.2023.	Đilda`s peatland	Mt. Zvijezda
7	09.07.2023.	Han Kram peatland	Han Pijesak
8	09.08.2023.	Đilda`s peatland	Mt. Zvijezda
9	25.08.2023.	Đilda`s peatland	Mt. Zvijezda
10	10.09.2023.	Jezerca peatland	Mt. Vranica
11	19.09.2023.	Đilda`s peatland	Mt. Zvijezda
12	08.10.2023.	Duga/Slana bara	Bijambare PL
13	28.10.2023.	Đilda`s peatland	Mt. Zvijezda
14	04.11.2023.	Duga/Slana bara	Bijambare PL
15	25.02.2024.	Duga/Slana bara	Bijambare PL
16	10.03.2024.	Đilda`s peatland	Mt. Zvijezda
17	07.04.2024.	Đilda`s peatland	Mt. Zvijezda

Table 1. List of completed field research on four main peatland sites in Bosnia and Herzegovina

It is important to highlight that every field research takes at least 2-3 days of laboratory analysis in order to determine collected fungal species and to input all relevant data into FAMU (electronic database and fungarium).

From the last report we have managed to find some very important and intriguing fungal species, most of them are indicator species, highly specialized for peatlands as rare and endangered habitat type in this part of Europe.



Photo 1. Rare and endangered peatland fungal species – *Hygrocybe coccineocrenata* (Đilda`s peatland, Mt. Zvijezda)



Photo 2. Indicator and stenovalent peatland species – *Bogbodia uda* (Duga bara, Bijambare)

Some of the most important recorded fungal species are: *Hypholoma ericaceum*, *Bogbodia uda*, *Hygrocybe coccineocrenata*, *Arrhenia leucotricha*, *Galerina sphagnorum*, etc. All these findings represent first official records for Bosnia and Herzegovina.



Photo 3 & 4. First time recorded in Bosnia and Herzegovina – *Arrhenia leucotricha* (Đilda's peatland). Macrophoto above (photo 3), microphoto bellow (photo 4).



Arrhenia leucotricha is quite rare and not enough understood fungal species from the family *Hygrophoraceae*. In our case, it decompose dead remnants of *Filipendula ulmaria* plant.

Book preparation

Preparation, design and illustration of the book "Peatlands Fungi in Bosnia and Herzegovina" is now at its final stage. Total number of pages is more than 200 with close to 100 most important registered fungal species being richly illustrated and described.

For each species most important details will be specified through symbols: ecology, IUCN proposed conservation status, indicator status and information if it is first official finding for mycobiota of Bosnia and Herzegovina.



Description of each species will be followed with high quality photos of fungi as well as some drone photos of the peatlands and associated habitat.

Book will be printed in 200-300 copies and will be distributed to the all relevant authorities in Bosnia and Herzegovina in both entities. Apart of authorities, book will be given to he all National and City Libraries in Bosnia and Herzegovina as well as to all Faculties for Natural Science, relevant schools, other similar associations and societies, etc.

Book promotion will be held together with documentary movies premiere in National Museum of Bosnia and Herzegovina in Sarajevo, as proposed within project application.

Documentary movie

A hours of video material have been recorded so far. From the beginning of June video editing and producing of documentary movie about peatlands and fungi inhabiting peatlands will start.

Plan is to produce short documentary movie up to 30 minutes long and to show and to present it for the first time along with previously mentioned book within National Museum of Bosnia and Herzegovina.

Documentary movie will be afterwards broadcasted on YouTube MycoBH channel with sponsored posts about its premiere.

Mycology workshop

At the very end of the planned project activities we are planning to organize mycological workshop at the area close to the one of the main peatlands in Bosnia and Herzegovina. Workshop will be held in September or October and we believe this will be great opportunity to record some very important fungal species. Currently, we are above 150 fungal species registered in the peatlands of Bosnia and Herzegovina.



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Mitrula paludosa Fr.
- Duga bari, Bjelovar -

Kratki opis: Askospori cilindrične, poprilično prave, sastavljene iz dva jasno odvojena dijela, visine 2,5-4,5 (5) μm ; klavula (askogeni dio) nepravilno zadržana, najčešće poput glave šibice, širine do 1 μm , svijetložuta do jarkožuta, glatka, jasno odvojena od ostale; ostica cilindrična, nepravilnog oblika, bjelkasta ili čak prozirna, glatka, najčešće čini 2/3 plovnog tijela.

Mikroskopija: Askospora * $(14,3)$ 15,0-17,5-18,9 (22,3) \times (2,6) 2,5-3,1-3,5 (3,4) μm [Slika 1-4], cilindrične, zadržanih polova ili malo zadržane, česta inkluziona, kod starijih primjeraka s uočljivom septom; askus cilindrični, bjelkasti, posvjetlova * $40-65 \mu\text{m}$, 8?; parafize filiformne, * $2,3-3,0 \mu\text{m}$ u apikalnoj, septirane, u presjelu pregrada so-

dite sličnubi pigment, sjeklo se granaju.

Fenologija i stanište: Živi kao saprotrof različitih odumrlih biljnih ostataka na veoma vlažnim staništima ili na tresetitima među Sphagnum spp. Podnosi u presjelu i jelo.

Presjedna ugrađenost: Nasiljiva staništa koja se kategoriju kao veoma opsežna i limitirana. U okviru istraživanja zabilježena na Dugoj bari i Hran. Kram tresetitima. Pored tresetita moguća je, prema pronađenoj, pronađ i na drugim tipovima vlažnih staništa i biljnim ostacima unorjenim u vodu. Predlaže se status ugrađenog taksona (EU), na osnovu kriterija E1ab(EU)+E2ab(EU)+E3ab(EU)+E4ab(EU).



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Tizodia acrobata Louka
- Duga bari, Bjelovar -

Kratki opis: Askospori apotečaste, nepravilno hemisferične ili blago turbinatne, prečnika 0,3-0,4 mm, svijetlo ružičaste do prijavobijele, vrlo teško se opočaju golim okom.

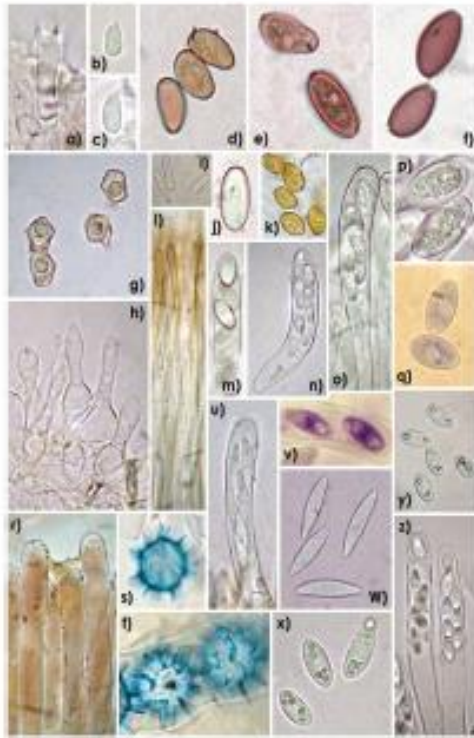
Mikroskopija: Askospora * $(16,9)$ 17,7-18,5-19,6 (19,8) \times (9,0) 9,1-9,5-9,7 (9,9) μm , nepravilno elipsoidne, najčešće petlovnice, glatke, ispužene mnogobrojnim stihim ugrubim kapi (Slika 1-p); askus * (84) 90,7-99,3-109,9 (123,6) \times (11,8) 12,0-12,3-12,7 (13,1) μm slična kalne, zakrivljeni, spođe 8 askospora (Slika 1-c); parafize cilindrične, zakrivljene, septirane, u vinom dijelu blago proširene, * $11,9$ 2,1-3,0 (3,5) μm .

Fenologija i stanište: Živi u nekoj vrsti simbioze sa cijanobakterijama iz roda Nostoc (Lamnocelesna ili amokete mije na fotogalij i spod) koje naseljavaju vršne dijelove mahovine tresetara - Sphagnum spp. Za ovu asocijaciju se pretpostavlja da je neki atakčni oblik simbioze, a ova vrsta je akarakterizirana kao prelazni oblik između gijva i filicija (Eckstein, 2021). Podnosi jelo.

Presjedna ugrađenost: Zabilježena do sada samo u Njemačkoj, Finskoj, Švedskoj, Norveškoj i BiH. Predlaže se status ugrađenog taksona (EU), na osnovu kriterija E1ab(EU)+E2ab(EU)+E3ab(EU)+E4ab(EU).



Photo 5. Details from the book – Petlands Fungi in Bosnia and Herzegovina



Slika 1. Nizna karakteristične nekih vrsta gljiva pronađenih na tresetima u BiH.

Slika 1. - a), b), c) *Aspergillus leucothrix* (Džidno tresetište) - a) "baciđe, b) i c) "zrno bazidiospore; d) *Hyalospora elongatum*, "zrno bazidiospore (Džidno tresetište); e) *Aspergillus* "zrno bazidiospore (Duga bara, Bjambare); f) *Hyalospora elongatum*, "zrno bazidiospore (Duga bara, Bjambare); g) *Entoloma abrotanense*, "zrno bazidiospore (Duga bara, Bjambare); h) *Gaeletha paludosa* (van fram tresetište) - i) "zrno bazidiospore; j) *Chelocystidia* (i) *Mitula paludosa*, "zrno oskopore (Duga bara, Bjambare); k) *Ustilobolus macrotichus* (Duga bara, Bjambare) - l) "zrno oskopora, m) "zrno oskopore; n) *Pseudoplectaria nigella*, pigment u vršnom dijelu "parafite (Duga bara, Bjambare); o) *Alibambosilla elaphoi* (Bjambare, manje tresetište u letrici), "zrno oskopore; p) *Pteridion acrobis*, "zrno oskopore (Duga bara, Bjambare); q) *Mycoloclethrion scipicola*, "zrno oskopore u *Gemma stipiti* (Džidno tresetište); r) s) *Ustilobolus macrotichus* (Duga bara, Bjambare) - r) "parafite, vršni dio, s) "oskopore u parafitnom dijelu; t) *Ustilobolus macrotichus* (Duga bara, Bjambare) - u) "zrno oskopore, v) "zrno oskopore; w) *Monilia baccorum* (Džidno tresetište) - v) oskopore u acetaminu; y) "zrno oskopore; x) *Claviceps henningsiana* (Sijana bara, Bjambare) - z) "zrno oskopore, z) "zrno oskopore.

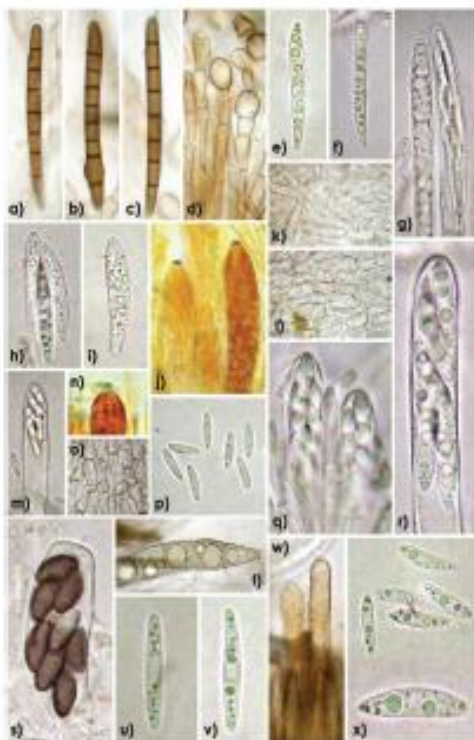
Sljedeće slike:

Slika 2. - a), b), c), d) *Geoglossum sphagnophilum* (Džidno tresetište) - a), b), c) "zrno oskopore, d) "karaktističan vršni dio parafite; e), f), g), h) *Sarcosella olivaceo-rosea* (Džidno tresetište) - e), f) "zrno oskopore, g) "zrno oskopore, h) "vršni dio oskopuluma; i), j), k), l) *Selכותocystophora hypoxarum* (Jokoino Džidno tresetište) - i), j) "zrno oskopore, k) "vršni dio oskupa i spolni aparat u li, l) "vršni dio oskopuluma; m), n) *Hymenocystis cf. schimpelii* (Džidno tresetište) - m) "vršni dio oskupa i oskopuluma, n) "vršni dio spolnog aparata; o), p) "vršni dio oskopuluma; q) *Hymenocystis cf. varicosa* (Džidno tresetište) - p) "zrno oskopore, q) "vršni dio oskupa i oskopuluma; r), s) *Phaeohelotium griseobrunneum* ad int. (Džidno tresetište) - r) "vršni dio oskupa i oskopuluma - parafite; s) "zrno oskopore; t) *Ustilobolus macrotichus*, "zrno oskopore (Duga bara, Bjambare); u) *Ustilobolus macrotichus*, "zrno oskopore (Jokoino Duga bara, Bjambare); v) *Lachnum albifurum*, "zrno oskopore (manje tresetište, Bjambare); w) *Ustilobolus macrotichus* (manje tresetište, Bjambare) - u) "zrno oskopora, w) "vršni dio oskopore.

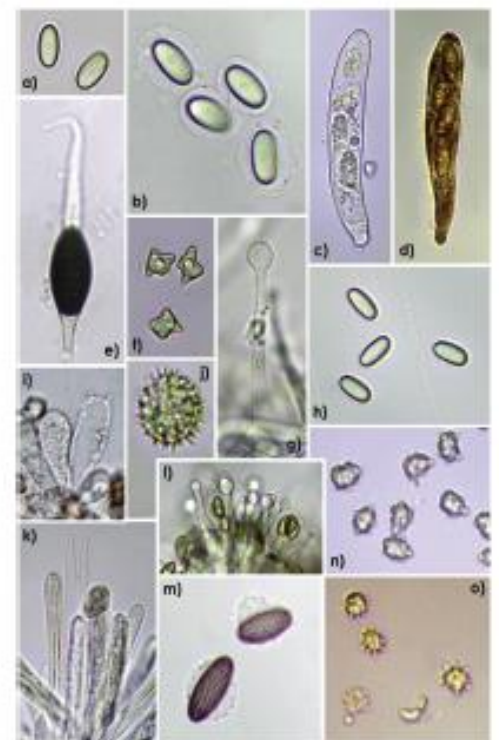
Sljedeće slike:

Slika 3. - a), b) *Chelocystidia magnifica*, "zrno oskopore i perisporigijum (Džidno tresetište); c) *Peziza fragilis* (Duga bara, Bjambare) - c) "zrno oskopore; d) "zrno oskopore u li; e) *Podopora appendiculata*, "zrno oskopora u karakterističnim produžecima u obliku noga - oskupa (Duga bara, Bjambare); f) *Entoloma contendendum*, "zrno bazidiospore (Džidno tresetište); g) *Galeina hybrida*, "chelocystidia (Džidno tresetište); h) *Pseudomorphia equina*, "zrno oskopore (Džidno tresetište); i) *Entoloma abrotanense*, "baciđe (Duga bara, Bjambare); j) *Amorbothia aspera*, "zrno oskopore (Jokoino Duga bara, Bjambare); k) *Lachnum apiculatum*, "zrno oskopore i parafite (Duga bara, Bjambare); l) *Ustilobolus macrotichus*, "zrno oskopore i multigenim omotačem (Džidno tresetište); m) *Inocybe napipes*, "zrno bazidiospore (van fram tresetište); n) *Omphalaster borealis*, "zrno bazidiospore (Duga bara, Bjambare).

Sljedeće slike:



Slika 2. Nizna karakteristične nekih vrsta gljiva pronađenih na tresetima u BiH.



Slika 3. Nizna karakteristične nekih vrsta gljiva pronađenih na tresetima u BiH.

Project promotion

Additional social media videos in reels format have been recorded and published on Facebook, Instagram and YouTube MycoBH profiles and channels. Both are from the Đilda's peatland in Mt. Zvijezda:

- <https://www.youtube.com/shorts/uFhuIGPeUA0>
- <https://www.youtube.com/shorts/4Fk9-t4qSLM>



Social media posts



Photos from filed research

