

# INTERIM REPORT

## Discovering the Diversity of the Alpine Ascomycetous Fungi in Severely Vulnerable Ecosystems of Glacial and Other Mountainous Lakes in Bosnia and Herzegovina



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## **FIELD RESEARCH**

We have been waiting for summer months to come in order to continue with project and field research. Most of the glacial and other mountainous lakes are within the subalpine to alpine zone and fungal species which have adapted here requires specific temperature of the substrate in order to produce ascomata. So far in the period from late June until beginning of August we have done 5 field research and investigate 8 lakes in total (Lake Crno, Lake Bijelo, Lake Veliko and Lake Platno on Mt. Treskavica; Lake Gornje Bare, Lake Donje Bare and Lake Kladopoljsko on Mt. Zelengora and Lake Lokvanjsko on Mt. Bjelašnica). All mentioned lakes are situated at the altitudes from 1.300 to 1.760 m asl). For the next period from mid-August to the end of September we have plan to organize 5 more field research and to visit and investigate Lake Crvanjsko (Mt. Crvanj), Lake Orlovačko, Lake Štirinsko and Lake Kotlaničko (Mt. Zelengora), Lake Šatorsko (Mt. Šator), Lake Idovačko (Mt. Raduša). All field research activities are planned to be finished at the end of September with more than 15 mountainous lakes investigate in total.

## **RESULTS**

The results are very successful whilst some of the recorded fungal species are quite intriguing and represents first official findings for Bosnia and Herzegovina and region as well.

### **Brief overview off the results and most important findings:**

1. *Gloeotinia juncorum* (Lake Crno, Mt. Treskavica) – first time recorded in Bosnia and Herzegovina.
2. *Myriosclerotinia duriaeana* (Lake Crno, Mt. Treskavica) – first time recorded in Bosnia and Herzegovina. Very important indicator species which only lives in specific marshlands or peat bog habitats. It indicates that this lake is very well preserved and untouched habitat.
3. *Heterosphaeria alpestris* (Lake Veliko, Mt. Treskavica) – first time recorded in Bosnia and Herzegovina.
4. *Moellerodiscus* sp., *Cistella albidolutea*, *Coronellaria caricis* and one bryophilous species from *Conocephalum* sp. - first time recorded in Bosnia and Herzegovina. All mentioned are very important findings from Lake Bijelo (Mt. Treskavica) at almost 1.700 m asl and represent fungal species which have managed to adopt to the extreme and severe weather and climatic conditions.
5. *Lachnum schoenoplecti* (Lake Gornje Bare, Mt. Zelengora) – first time recorded in Bosnia and Herzegovina.
6. *Neottiella ithacaensis* from *Marchantia* sp. liverwort (Lake Lokvanjsko, Mt. Bjelašnica) – first time recorded in Bosnia and Herzegovina.

These fungal species are only the most important one recorded while at the same time many more typical and usual species have been found on each lake. Number of different fungal species recorded per one field research is variable (from 5 to 15).

In the second project phase we will write one scientific paper and published it in some peer-reviewed journal.

While fungal diversity at the investigated areas is somewhere abundant and diverse at the same time all lakes which we have investigated are shrinking and slowly but surely overgrown by marshland vegetation. Within the project activities we have also measured dimensions of the lakes and most of them are slightly or even significantly smaller when compared to the latest dimensions from the relevant literature. This is as expected due to the final evolutive stage of the glacial and other mountainous lakes in Bosnia and Herzegovina.

That is why it is very important to investigate mycobiota of these unique habitats before they disappeared. At the same time huge efforts should be made in order to at least slow down process of shrinking and overgrowing at some of the lakes.

## **EQUIPMENT**

All necessary photo and video equipment specified within project budget have been bought and now being used in all field research. Most of the equipment is being used for shooting scene for documentary movie (DSLR camera, drone for aerial views and GoPro camera) whilst different type of photos made with these devices will be used in final project publication/book.

## **DOCUMENTARY MOVIE**

Video material have been recorded on each mountainous lake we have visited. So far, we have used DSLR camera for shooting video, drone for aerial perspective and GoPro for underground and underwater videos. Besides video material that is recorded by us (Mycological Society MycoBH) team from National Broadcasting Service (BHRT) with professional equipment will join us in two field research. Documentary movie will be assembled in coproduction of BHRT and Mycological Society MycoBH at the end of the project and will be broadcasted on National TV station.

In the meantime, on almost each field research and on each glacial lake we recorded one short movie and share it on our YouTube channel. Besides short movie with lake in main focus some other videos from field research are shared on our YouTube channel.

All so far recorded materials can be found here:  
<https://www.youtube.com/channel/UCc4ZnCjmJtCxlEecx2g0AuQ>

## **PROJECT PROMOTION**

Besides mentioned research activities and results we have done numerous things in order to promote project activities:

- We have created profile for Mycological Society MycoBH on GBIF official page and start to upload and update checklist of fungal species of glacial and other mountainous lakes in Bosnia and Herzegovina.

- We have created promo material that will be distributed to interested parties and relevant stakeholders (face masks, notebook, caps, etc) and will soon create other promo material for interested parties (flyer, brochure).
- We have recorded some new fungal species for Bosnia and Herzegovina in general which will be published and described in detail within the scientific paper and project monography at the end.
- We have recorded numerous video clips and materials by drone or other type of camera – all can be viewed and assessed on our YouTube channel: <https://www.youtube.com/channel/UCC4ZnCjmJtCxlEecx2g0AuQ>
- Additional promotion of project activities have been done through official web page of Mycological Society MycoBH – [www.mycobh.com](http://www.mycobh.com) and Facebook Page - <https://www.facebook.com/mycobh>

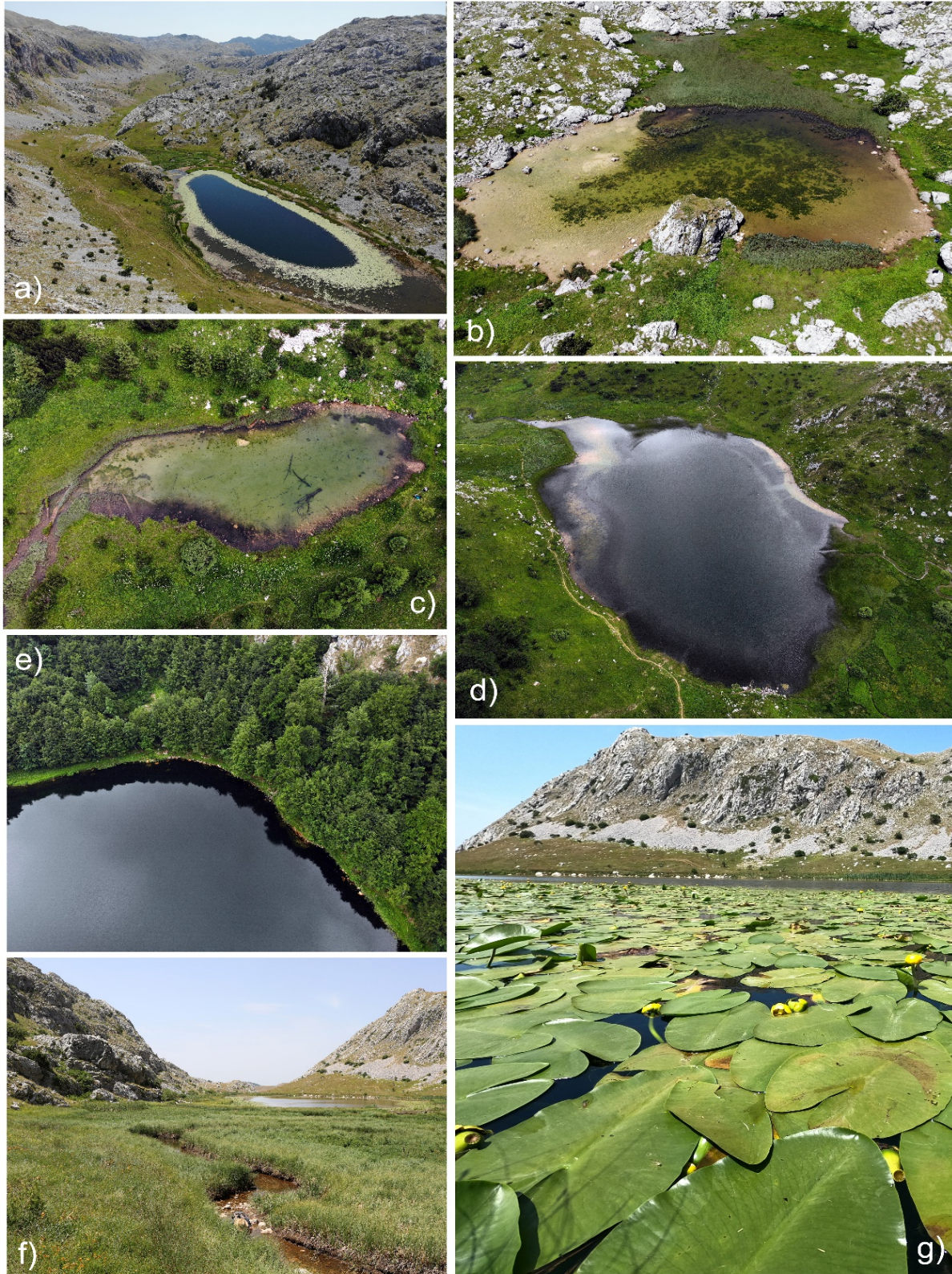
Even though global pandemic of Sars-CoV2 virus have made everything much more difficult to complete we have successfully managed to obtain desired dynamics of project activities planned.

## **PHOTOS**



**Figure 1.** At Lake Lokvanjsko, Mt. Bjelašnica with team from National Broadcasting Service (BHRT). Photo: Nedim Jukić





**Figure 2. a)** Lake Kladopoljsko, Mt. Zelengora; **b)** Lake Bijelo, Mt. Treskavica; **c)** Lake Platno, Mt. Treskavica; **d)** Lake Veliko, Mt. Treskavica; **e)** Lake Donje Bare, Mt. Zelengora; **f)** Main water source at Lake Kladopoljsko, Mt. Zelengora; **g)** Specific water vegetation at Lake Kladopoljsko. Photo: Nedim Jukić





**Figure 3. a)-h)** Scenery and photos from field research at Lake Veliko, Lake Platno, Lake Bijelo (Mt. Treskavica) and Lake Kladopoljsko (Mt. Zelengora). Photo: Braco Babić and Nedim Jukić





**Figure 4.** **a)** *Orbilia sarraziniana*, Lake Gornje Bare (Mt. Zelengora); **b)** *Cyathicula* sp. from *Rumex*, Lake Donje Bare (Mt. Zelengora); **c)** *Myriosclerotinia duriaeana*, Lake Crno (Mt. Treskavica); **d)** *Trichopeziza mollissima*, Lake Veliko jezero (Mt. Treskavica); **e)** *Lachnum schoenoplecti*, Lake Gornje Bare (Mt. Zelengora); **f)** *Scutellinia heterosculpturata*, Lake Gornje Bare (Mt. Zelengora); **g)** *Hymenoscyphus menthae*, Lake Veliko (Mt. Treskavica). Photo: Nedim Jukić