

Columbia University/
Háskólinn á Akureyri
Borgum v/Norðurslóð
600 Akureyri
Iceland

Reykjavík, 05.09. 2023
UST202307-128/G.G.
09.04.00

Subject: Investigating Lipid Biosignatures and Bacterial Communities in Icelandic Lava Tubes

The Environment Agency of Iceland has received an application from Columbia University and Háskólinn in Akureyri, dated 10th of July 2023, for a research in lava tubes within Snæfellsjökull National Park and Lake Mývatn area, as well as other areas which are not under the supervision of the Environment Agency of Iceland, from the 4th – 25th of September 2023.

The cave in question in the Lake Mývatn area is under the supervision of the Environment Agency, based on act no. 60/2013. Permission from the Environment Agency of Iceland is needed for visiting the cave.

Snæfellsjökull National park is protected as a national park cf. regulation no. 935/2021. Operating an unmanned aircraft within the national park is subjected to a permit from the Environment Agency of Iceland according to art. 7 in the Regulation during nesting season. All nature-related research, that is not legally endorsed by a research institution is subject to permission from the Environment Agency of Iceland.

Description of the project:

The project applied for is a research project and collection of samples from lava tubes in the Purkhólahraun in National Park Snæfellsjökull and in the Mývatn area, focusing on small lipid molecules. The sample collection will require chipping small amounts of geological substrate containing the surface biofilm. Smallest amount possible of loose volcanic rock and tephra from the lava tubes will be collected, sampling five different locations per cave in 50 mL falcon tubes.

Number of participants on location is 8.

Impact assessment:

The Environment Agency of Iceland considers the project to be unlikely to affect the natural environment of the areas. The research will have a positive effect on the conservation value of the areas as it will increase knowledge of the biology of the caves.

Conclusions and conditions:

The Environment Agency of Iceland hereby grants Columbia University and Háskólinn in Akureyri permission on its behalf to conduct research on caves within Snæfellsjökull NP on 4th-25th of September and Mývatn and Laxá area on 18th-21st of September as described above on the following conditions:

- In the Mývatn area a ranger from the Environment Agency will accompany and assist the participants during a visit in the cave in the period from 18th-21st of September. The geological formations in the cave in Mývatn area are very delicate and researches should avoid places with high density of deposits. Samples of deposits should only be collected from those that are already broken and loose.
Access is difficult and requires the use of a rope to go down into the cave. The surrounding area is a construction site and must be approached with care. It is necessary to contact the company Jarðböðin in advance, info@jardbodin.is as well as the rangers in the area.
- Keep this letter with you on site during the project. The permit conditions should be introduced to the staff of the project before work begins.
- The applicant shall inform rangers in the area about their arrival and departure. This is to be done 24 hours before entering the Snæfellsjökull National Park area and 48 hours before entering the Mývatn area, and again before leaving the sites.
- If the project dates or description changes the Environment Agency shall be notified as soon as possible.
- When it is necessary to go off-path, extra care must be taken not to cause damage to terrain, including vegetation, soil and geological formation. All traces of activity must be removed afterwards.
- The crew must follow rules of conduct that apply to the area.
- Time spent in the area should be limited as possible.
- All traces of the work must be removed carefully from the site by the end of the work/project.
- If any complications occur during the project, please contact the ranger or the Environment Agency of Iceland, tel. +354 591 2000.
- This permit is only valid for research purposes. It does not include permit to utilize the samples for commercial purposes. The samples cannot be signed over to third party for commercial use.
- Every measure should be taken to avoid damage to the sites and unnecessary disturbance while collecting samples.
- Samples should be collected where any resulting disturbance to soil, vegetation or geological formations is not visible to other visitors.

- All vehicles used during field exploration must be labelled with the identity of the researcher's institute. All participants in the project must wear high-visibility clothing during field work, labelled with the identity of the researcher or the research institute.

If the developer causes damage to nature, according to art. 87 in the Nature Conservation Act no. 60/2013, the Environment Agency of Iceland can, according to the Nature Conservation Act, f.e. order the licensee to fix damage to nature and vegetation and/or stop the project.

The Environment Agency of Iceland can according to art. 89 in the Nature Conservation Act no. 60/2013 change conditions of the permit, add new conditions or withdraw the permit in order to prevent damage to nature if environmental conditions change.

According to art 89. in the Nature Conservation Act no. 60/2013 the Environment Agency can withdraw the permit if conditions of the permit are not complied to.

If you wish to export samples from Iceland a special permit is needed from the Icelandic Institute of Natural History (www.ni.is).

The Environment Agency of Iceland wishes to receive, free of charge, a copy of all reports and scientific articles that result from the research project.

Permission fee:

Environment Agency of Iceland charges a fee for processing applications for permits in protected areas based on Article 92 of Act no. 61/2013 on Nature Conservation. The fee for operational, research is **57.000 ISK** according to art. 29. a. in the agency's tariff no. 206/2023.

Supervision:

The Environment Agency will supervise the project. The supervisor will be a ranger from the Environment Agency.

Sincerely

Dagbjört Jónsdóttir
advisor

Guðbjörg Gunnarsdóttir
advisor