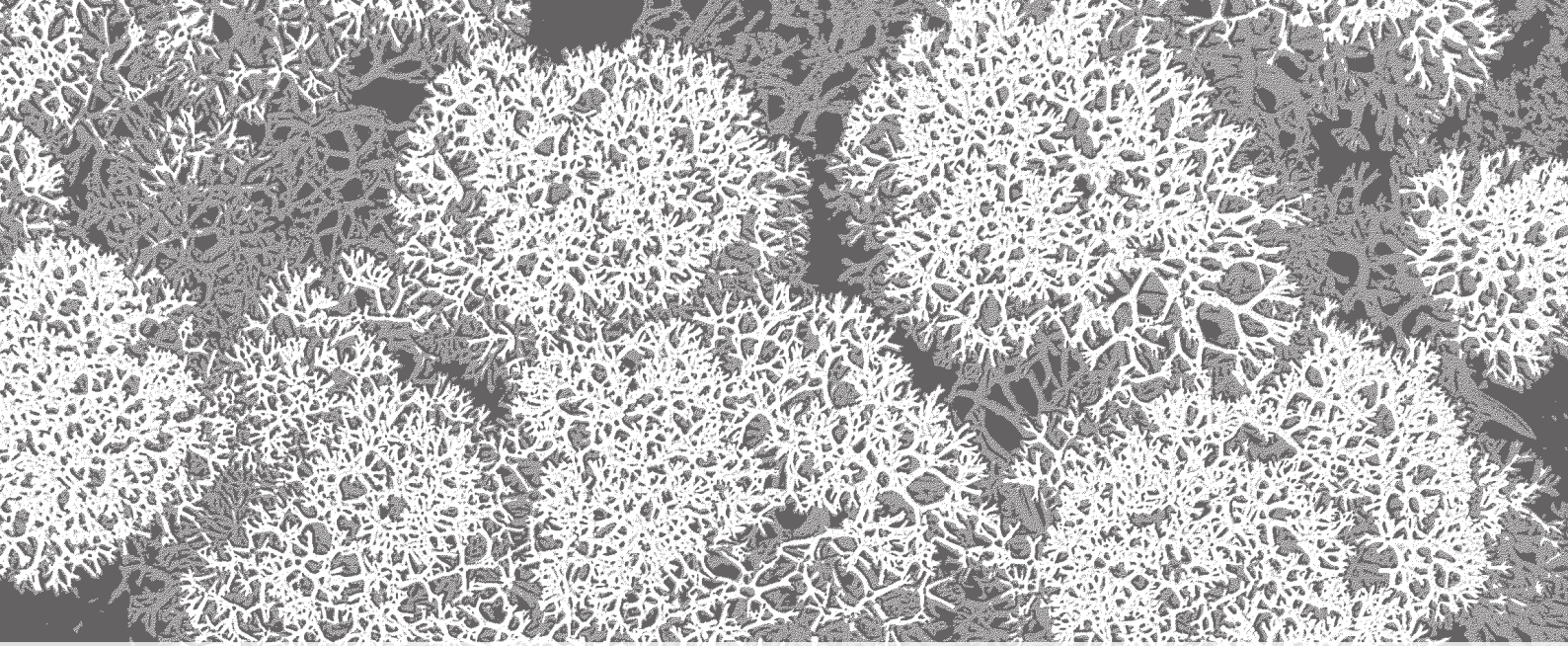

The 8th IAL Symposium Lichens in Deep Time August 1–5, 2016 Helsinki, Finland

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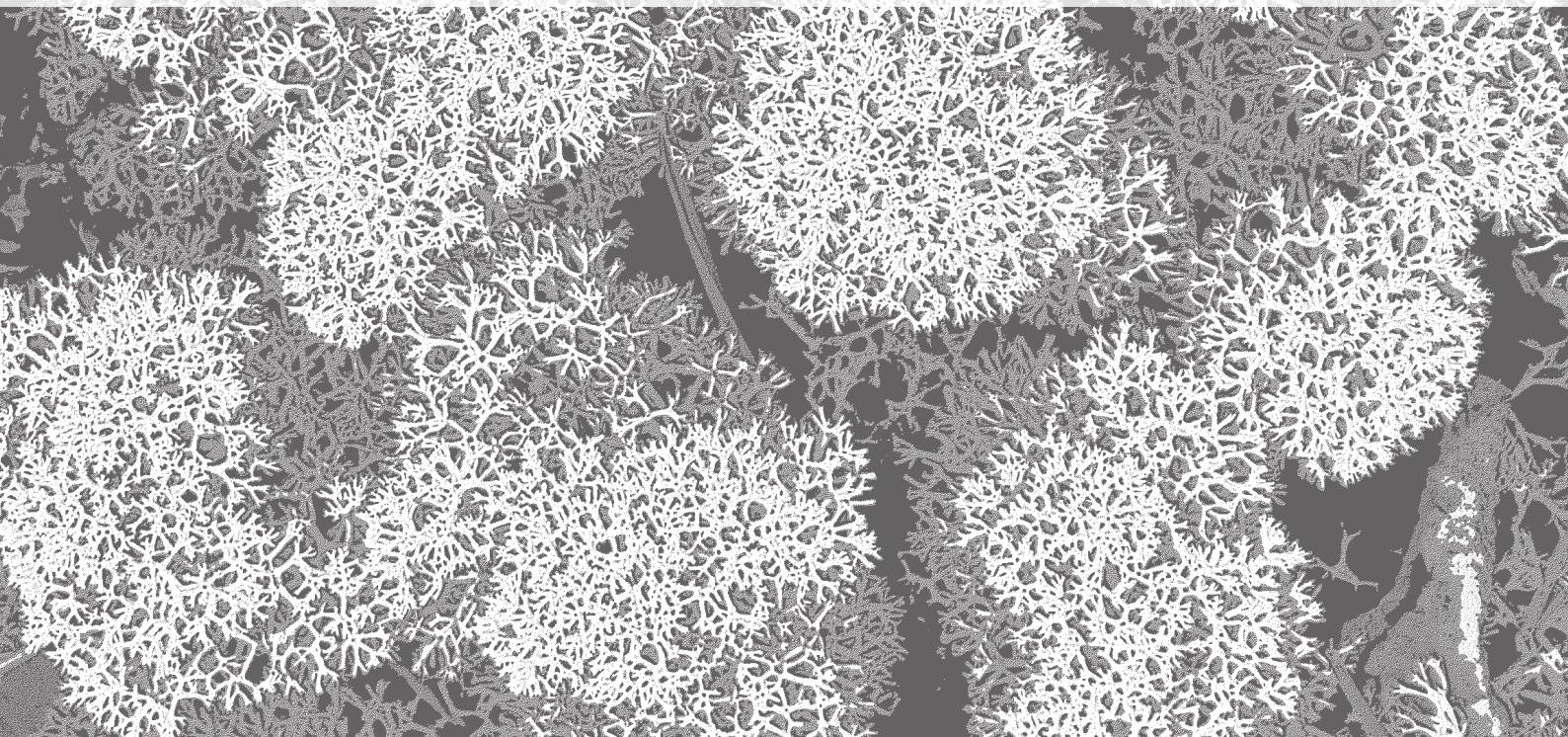

Identification of lichenous and lichenicolous diaspora in the atmosphere of Madrid (Spain) using Next-Generation Sequencing

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Lichens play a major role in the ecosystems. In the cities, lichens contribute to support biodiversity of micro- and macroorganisms and are useful as bioindicators of air pollution and environmental changes. Although we know that lichen diaspora (spores and vegetative propagules) can travel by the wind and colonize faraway areas, the species richness and abundance of lichen diaspora presented in the air is still scarcely known. We combine the use of Hirst-type volumetric aerobiological trap with the analyses from Next-Generation DNA Sequencing (NGS) The molecular marker analysed was the ITS2 of the rDNA. The samples were collected during one week in two different sites of Madrid (Spain). Sampling was repeated once for each season during a year. The preliminary results obtained for fungal identification show an interesting diversity of species of different taxonomic groups. This diversity varies among seasons of the year. We are analysing the dispersal strategies of the species and comparing the species record with the regional checklists of the Madrid province, bordering regions and whole Iberian Peninsula. Altogether, our preliminary results show that aerobiological techniques in combination with NGS analyses are a promising tool for the study of different subjects as ecology, biogeography or biological conservation. This study was funded by the Community of Madrid, Spain, under the AIRBIOTA-CM Program (S2013/MAE-2874).

How diverse and how local are the lichens in the Amazon?

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Lichen diversity is often thought to be highest in arctic or alpine regions, but the diversity in the tropics is higher, with up to 175 species occurring on one tree and nearly 100 on one leaf. Even though the country has only low mountains, Brazil is the country with the highest lichen diversity on earth. Currently 4000 species are known, a number that has risen with 100–200/year in recent years (half of them new to science). We did field work in Rondônia and Amapá, two states at the western and the eastern edge of the Amazon. In each, 300–400 species were identified. Some are widely distributed, but a real Amazonian lichen element could be detected. We already described 100 new species from Rondônia, mainly Arthoniales, Graphidaceae, *Opegrapha*, Pyrenulaceae, and Trypetheliaceae, that is c. 7 species per fieldwork day. A few dozen of these have already been found in other places, mainly in Amapá. But the collections from Amapá contain another 30+ new species. All published estimates about numbers of still undescribed species seem to be underestimations.

Towards a checklist of the lichens of the Alps

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The Alps are one of the largest continuous natural areas in Europe, stretching approximately 1,200 kilometres across eight countries, and including fourteen national parks. The Alpine Convention emphasizes the importance of this area and encourages transnational research and conservation projects. Lichens as unique models of fungal symbioses with macroscopically recognizable, light-exposed individuals are important colonizers of rock, soil and plant material, and they are a dominant symbiotic life form of higher altitudes in the Alps. National checklists or catalogues exist for Austria, France, Germany, Italy, Slovenia and Switzerland. The compilation of a catalogue of the lichenized fungi of the Alps is a long overdue task and will enable us to compare, for instance, the genera or species diversity of the Alps with those of other mountain systems of the world. We have summarized the abundant but scattered baseline information on lichen biodiversity in the Alps, which will lead to a transnational inventory of all lichen taxa (c. 3,000), including data on their horizontal and vertical distribution and their ecology. This information will be of use for experts, decision-makers, and citizen scientists.

Epiphytic lichens at ZBS (Moscow Region)

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Zvenigorod Biological Station of Moscow State University (ZBS MSU; 715.4 ha) is situated not far from Moscow (Russia). The main part of the territory is covered with aged forest. So the last years were rich in fallen trees. This sad phenomenon allowed study of trees all trunk long. The most common trees are *Acer platanoides*, *Betula pendula*, *Picea abies*, *Pinus sylvestris*, *Populus tremula*, *Salix alba*, *S. fragilis*. 32 macrolichen species are found on the bark in total (foliose – 20, fruticose – 12). The greatest number of species are typical for *Salix* and *Populus*. *Hypogymnia physodes* and *Parmelia sulcata* could be found on every tree. Lichen's abundance increases monotonically to the upper branches. The area of birch trunk occupied by lichens at 10 m high is about 30%, but at 25 m it is more than 70%. Lichen society complex changes great with height and many species one can find only above 10 m.