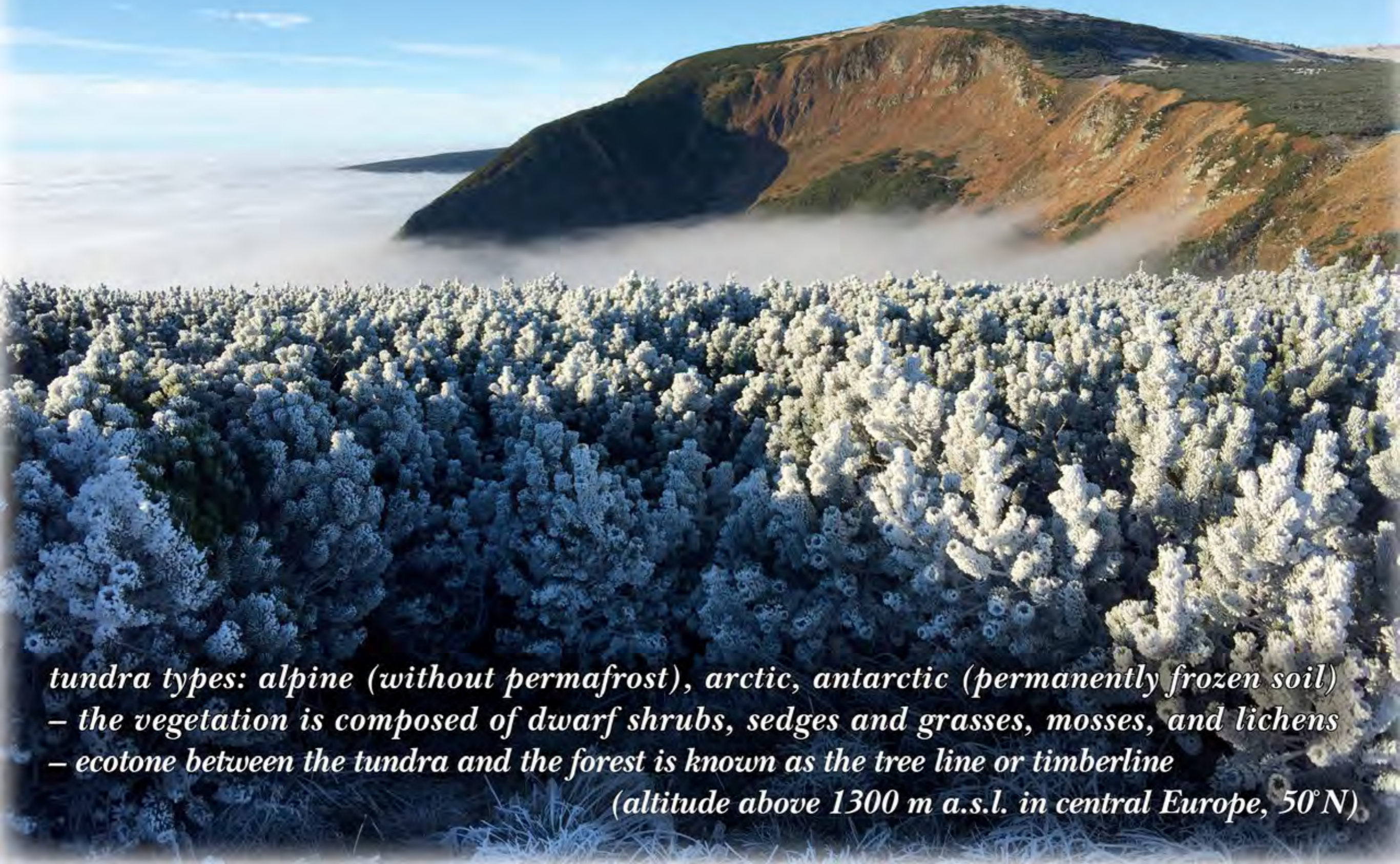


*DOMINATING AND SOME OVERLOOKED LICHENS  
IN HIGH ELEVATION ZONE OF KRKONOŠE MTS  
COMPARING WITH SUBARCTIC SCANDINAVIAN AND ALPINE SIBERIAN TUNDRA*



*Josef P. Halda, Muzeum a galerie Orlických hor, Rychnov nad Kněžnou, October 2015*

*TUNDRA is type of biome characteristic by low temperatures and short growing seasons  
(the tree growth is hindered)*



*tundra types: alpine (without permafrost), arctic, antarctic (permanently frozen soil)  
– the vegetation is composed of dwarf shrubs, sedges and grasses, mosses, and lichens  
– ecotone between the tundra and the forest is known as the tree line or timberline  
(altitude above 1300 m a.s.l. in central Europe, 50°N)*

*The arctic zone is defined to occupy the areas situated north of the polar timberline*



*Greenland, Spitsbergen, islands of the North Atlantic, Soviet Far East, Siberia and Russia, the coastal areas of Norway, Iceland, Newfoundland, Aleutian Islands, Kuril Islands and Kamchatka*

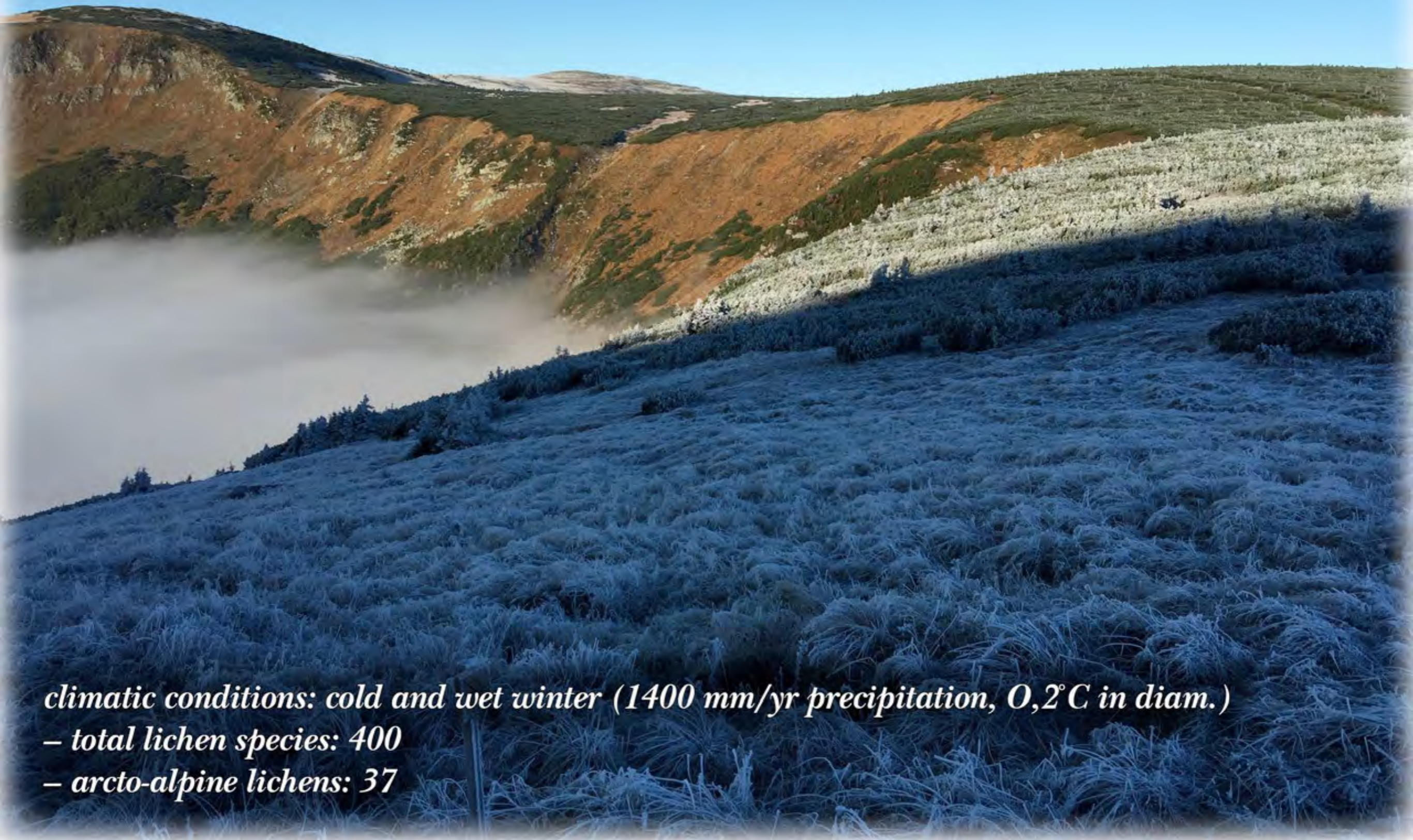
*terricolous lichens in arctic zone 90–270 kg/ha (4–9% of total aboveground biomass)  
– 3 million heads of reindeer in northern Eurasia*



*dominant terricolous lichens in arctic tundra*

*Alectoria ochroleuca, Bryocaulon divergens, Cetraria islandica, Cladonia sp., Dactylina arctica, Flavocetraria cuccullata, F. nivalis, Nephroma arcticum, Ochrolechia frigida, Peltigera leucophlebia, Protopannaria pezizoides, Solorina crocea, Sphaerophorus globosus, Thamnolia vermicularis*

*alpine tundra in Krkonoše Mts*

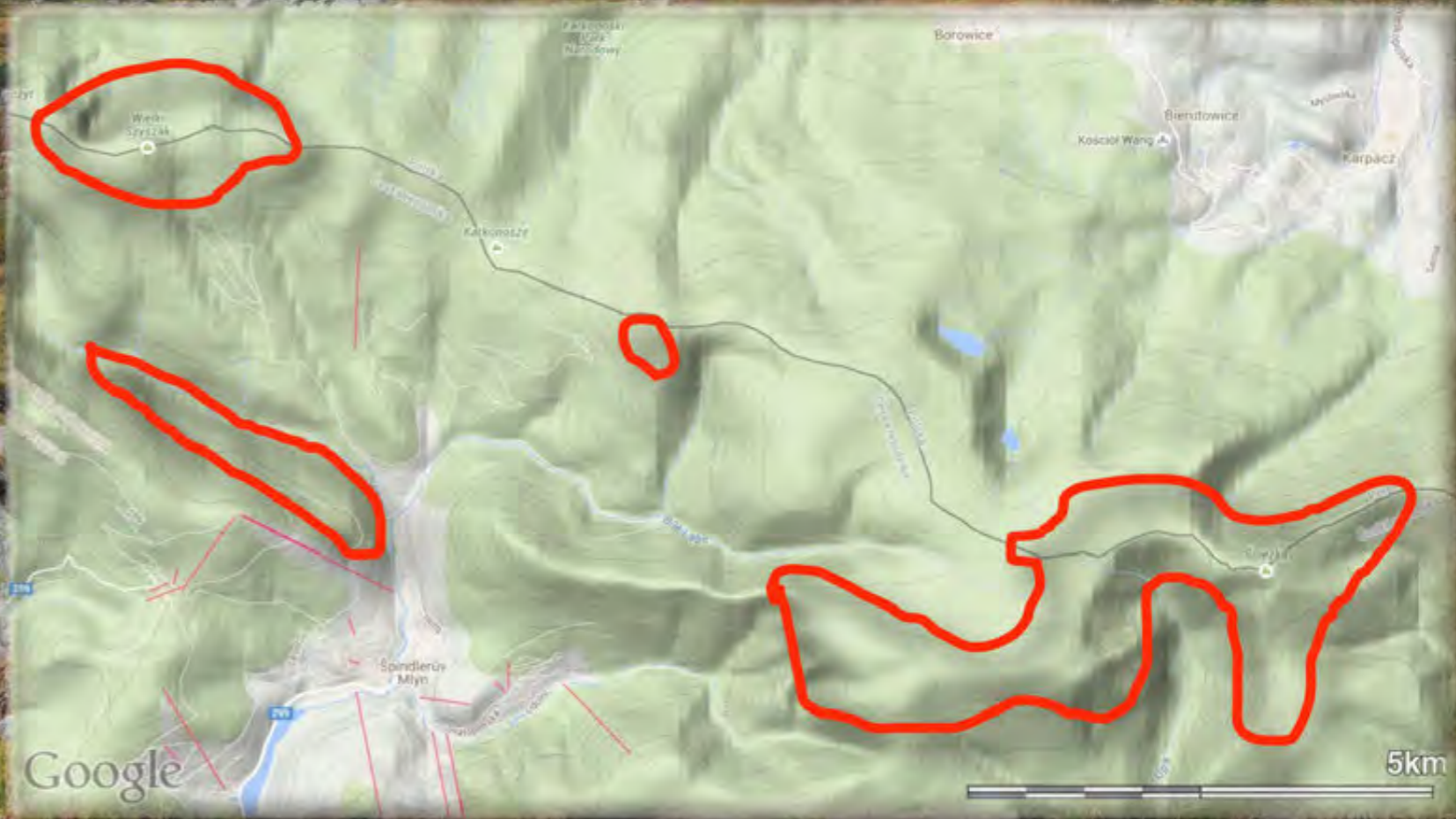
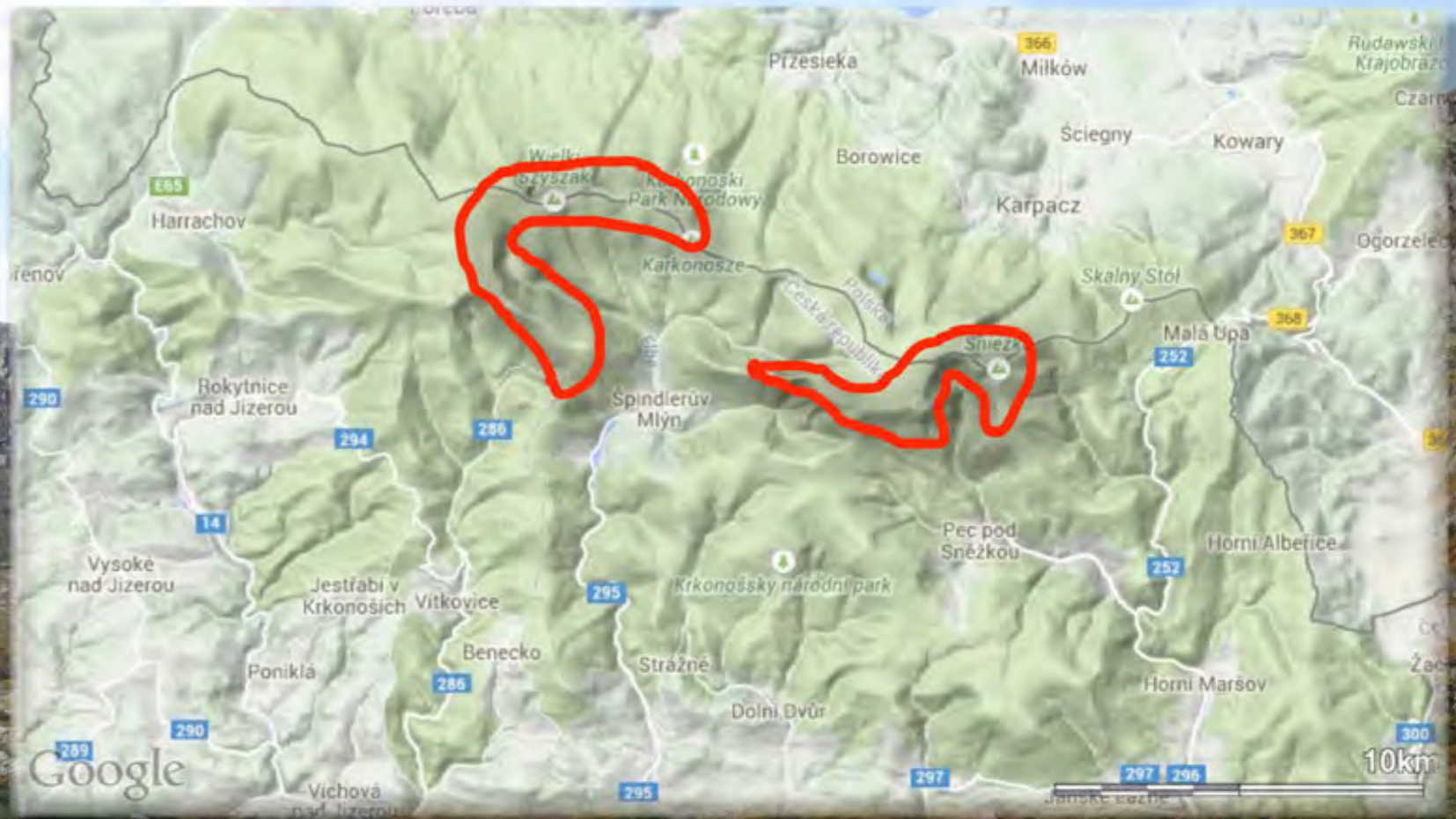


*climatic conditions: cold and wet winter (1400 mm/yr precipitation, 0,2°C in diam.)*

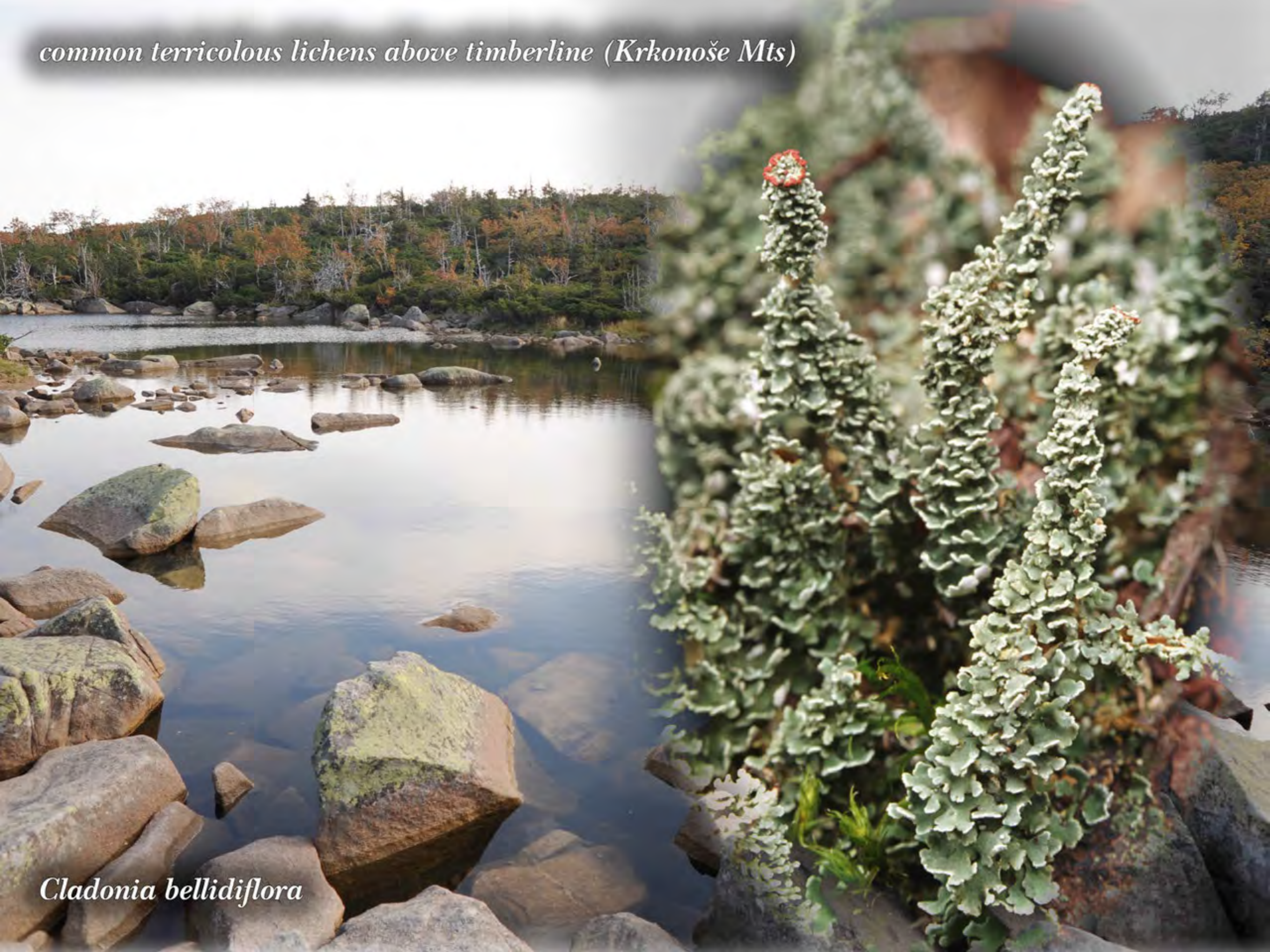
*– total lichen species: 400*

*– arcto-alpine lichens: 37*

*alpine tundra in Krkonoše Mts*



*common terricolous lichens above timberline (Krkonosé Mts)*



*Cladonia bellidiflora*

*dominant terricolous lichens above timberline (Krkonose Mts)*



*Cladonia rangiferina*



*common terricolous lichens above timberline (Krkonose Mts)*

*Cladonia arbuscula*



*dominant terricolous lichens above timberline (Krkonoše Mts)*



*Cladonia uncialis*

*dominant terricolous lichens above timberline (Krkonose Mts)*

*Stereocaulon vesuvianum*



*common terricolous lichens above timberline (Krkonose Mts)*



*Cetraria islandica*

*rare terricolous lichens above timberline (Krkonosé Mts)*



*Cladonia stellaris*

*dominant saxicolous lichens above timberline (Krkonosé Mts)*



*Rhizocarpon lecanorinum*

*dominant saxicolous lichens above timberline (Krkonose Mts)*



*Lecanora polytropa*

*dominant saxicolous lichens above timberline (Krkonosé Mts)*



*Lecidea lapicida*



*arcto-alpine elements (Krkonoše Mts)*



*Alectoria ochroleuca*

*arcto-alpine elements (Krkonoše Mts)*



*Flavocetraria cucullata*

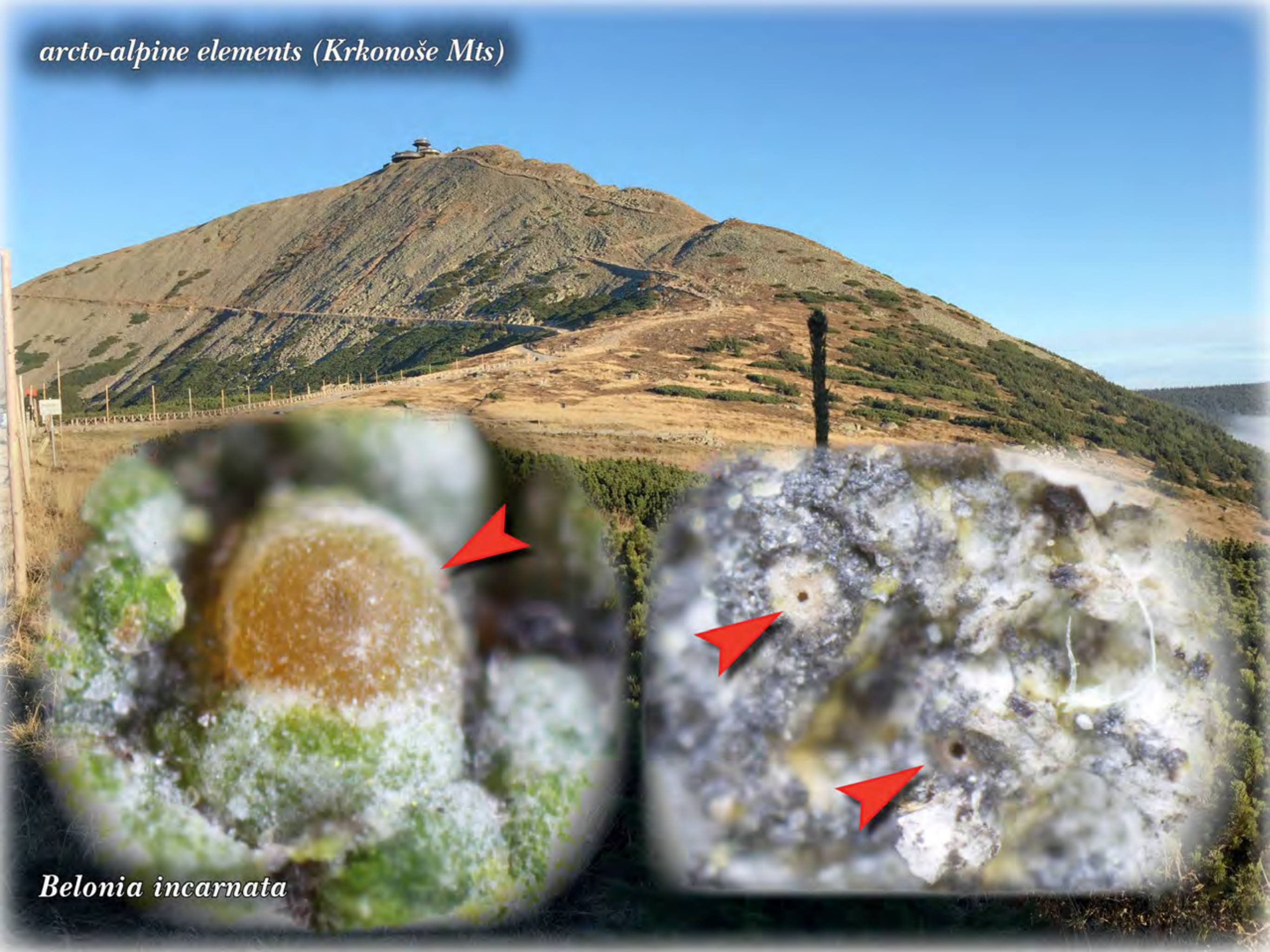
*Flavocetraria nivalis*

*arcto-alpine elements (Krkonoše Mts)*



*Lecidoma demissum*

*arcto-alpine elements (Krkonoše Mts)*



*Belonia incarnata*

*saxicolous arcto-alpine elements (Krkonose Mts)*



*Catolechia wahlenbergii*

*saxicolous arcto-alpine elements (Krkonose Mts)*



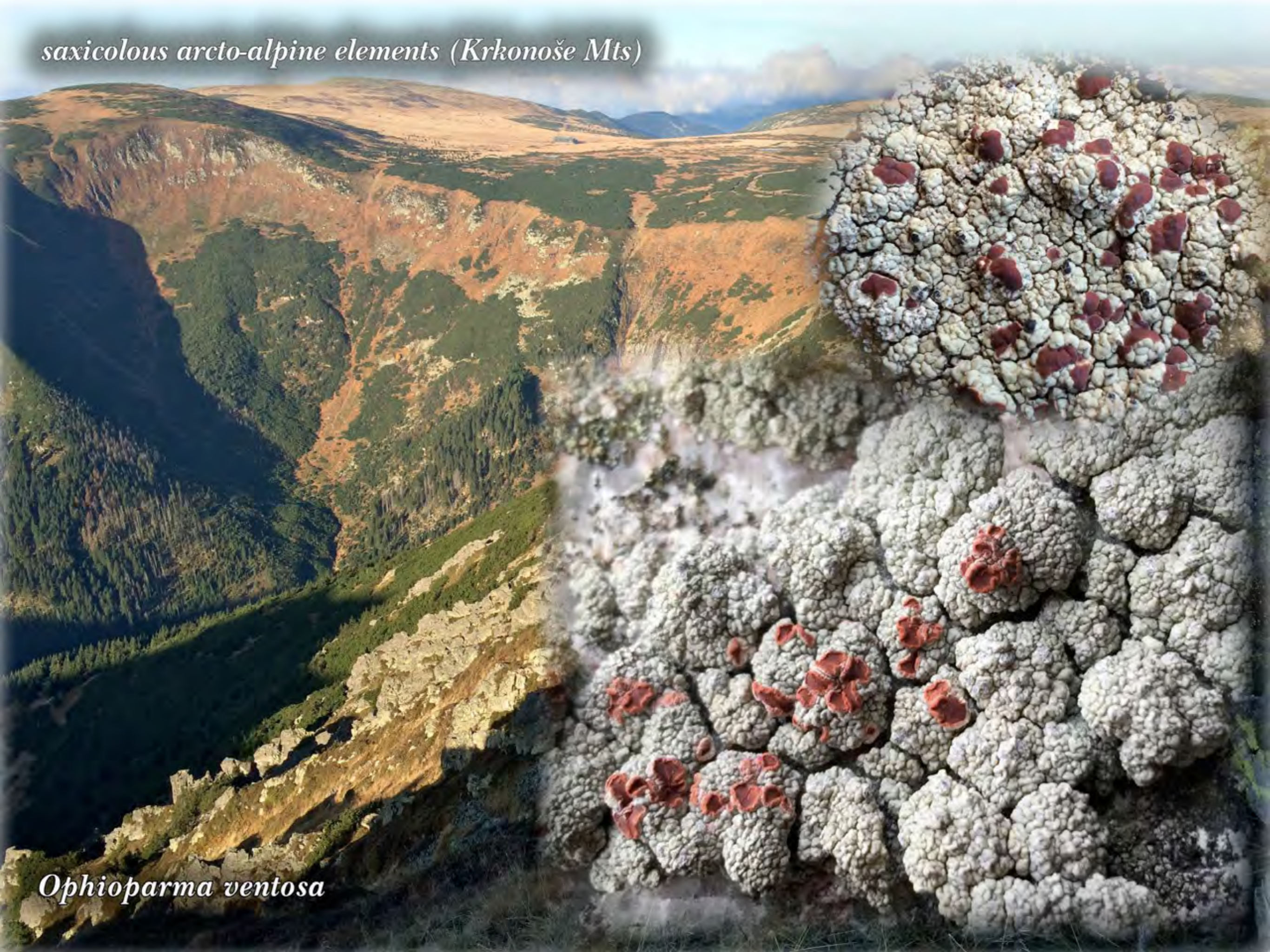
*Pilophorus strumaticus*

*saxicolous arcto-alpine elements (Krkonose Mts)*

*Sphaerophorus fragilis*



*saxicolous arcto-alpine elements (Krkonose Mts)*



*Ophioparma ventosa*



*saxicolous arcto-alpine elements (Krkonose Mts)*



*Bellemeria alpina*

*saxicolous arcto-alpine elements (Krkonoše Mts)*



*Tremolecia atrata*

*saxicolous arcto-alpine elements (Krkonoše Mts)*



*Pseudephebe pubescens*

*saxicolous arcto-alpine elements (Krkonoše Mts)*



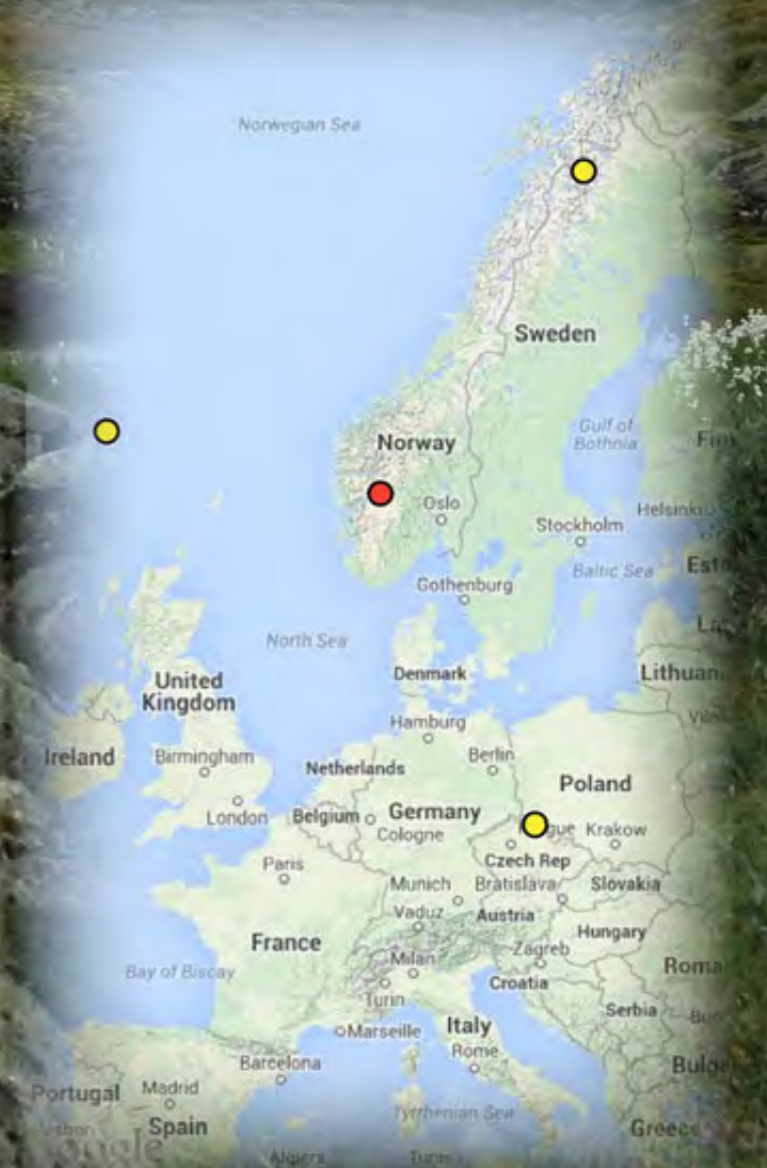
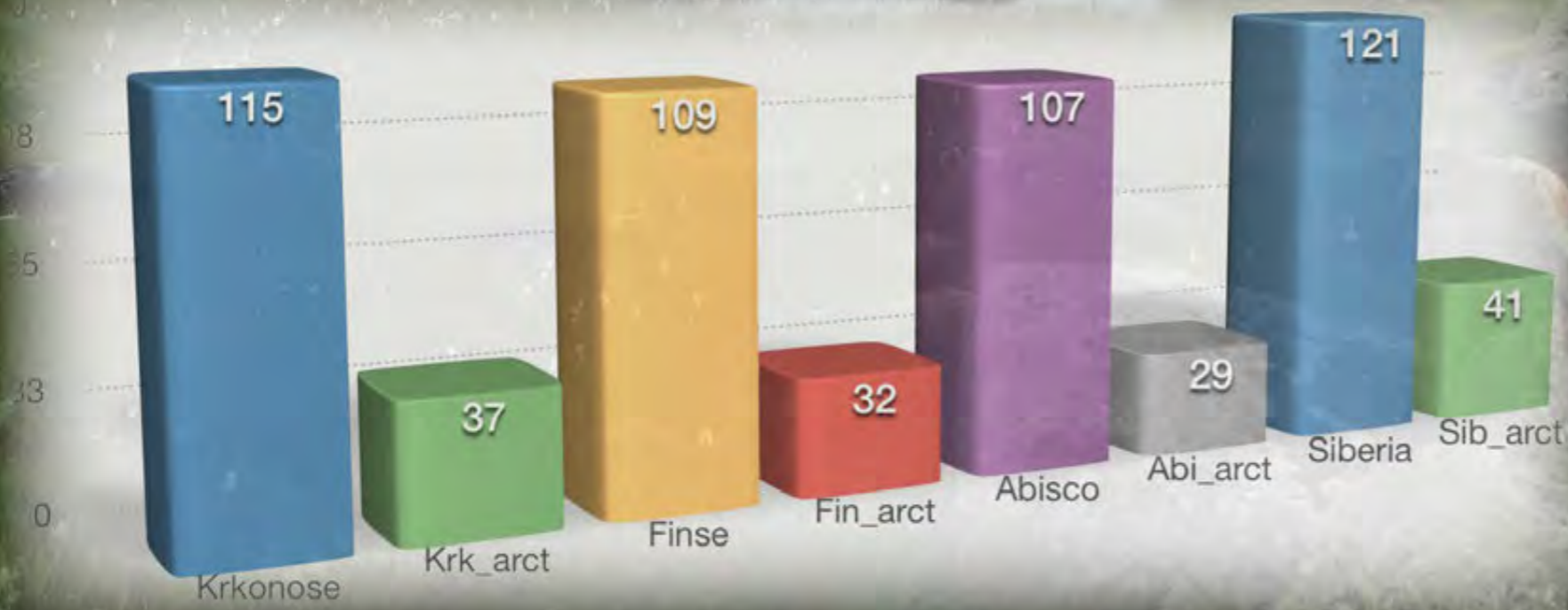
*Brodoa intestiniformis*

*terricolous arcto-alpine elements (Krkonoše Mts)*



*Thamnolia vermicularis*

*dominating lichens of subarctic tundra in Norway (Hordaland, Finse)*



*altitude 1300–1400 m a.s.l. , 60°N*

*dominating lichens of subarctic tundra in Norway (Hordaland, Finse)*



*Nephroma arcticum*

*dominating lichens of subarctic tundra in Norway (Hordaland, Finse)*



*Sphaerophorus globosus*



*dominating lichens of subarctic tundra in Norway (Hordaland, Finse)*



*Peltigera venosa*

*dominating lichens of subarctic tundra in Norway (Hordaland, Finse)*



*Peltigera leucophlebia*

*dominating lichens of subarctic tundra in Norway (Hordaland, Finse)*



*Bryocaulon divergens*

*dominating lichens of subarctic tundra in Norway (Hordaland, Finse)*



*Arctoparmelia centrifuga*

*dominating lichens of subarctic tundra in Abisko (Sweden)*



*altitude 1200–1300 m a.s.l. , 67N*

*dominating lichens of subarctic tundra in Abisko (Sweden)*



*Cornicularia normoerica*

*dominating lichens of subarctic tundra in Abisko (Sweden)*



*Flavocetraria cucullata*

*dominating lichens of subarctic tundra in Abisko (Sweden)*



*Flavocetraria nivalis*



*dominating lichens of subarctic tundra in Abisko (Sweden)*



*Protopannaria pezizoides*

*dominating lichens of subarctic tundra in Abisko (Sweden)*



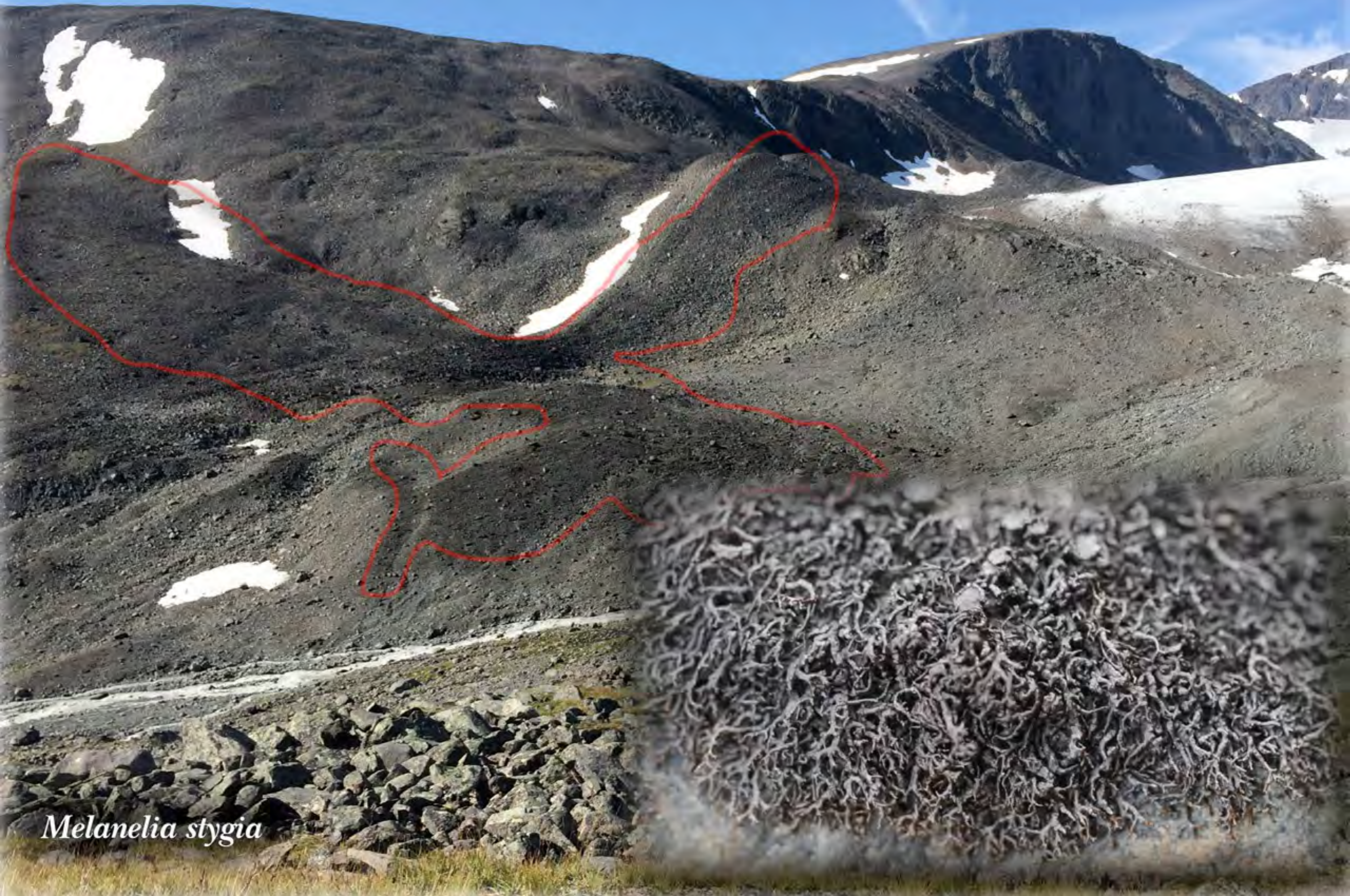
*Cladonia amaurocraea*

*dominating lichens of subarctic tundra*



*Solorina crocea*

*dominating lichens of subarctic tundra in Abisko (Sweden)*



*Melanelia stygia*

*dominating lichens of subarctic tundra in Abisko (Sweden)*



*Ochrolechia frigida*

*dominating lichens of subarctic tundra in Abisko (Sweden)*



*Phaeorrhiza nimbosa*

*dominating lichens of alpine tundra in South Siberia*



*altitude 1200–1300 m a.s.l. , 51°N*

*dominating lichens of alpine tundra in South Siberia*



*Cladonia evansii*



*dominating lichens of alpine tundra in South Siberia*



*Asahinea chrysantha*

*dominating lichens of alpine tundra in South Siberia*



*Ochrolechia upsaliensis*

*dominating lichens of alpine tundra in South Siberia*



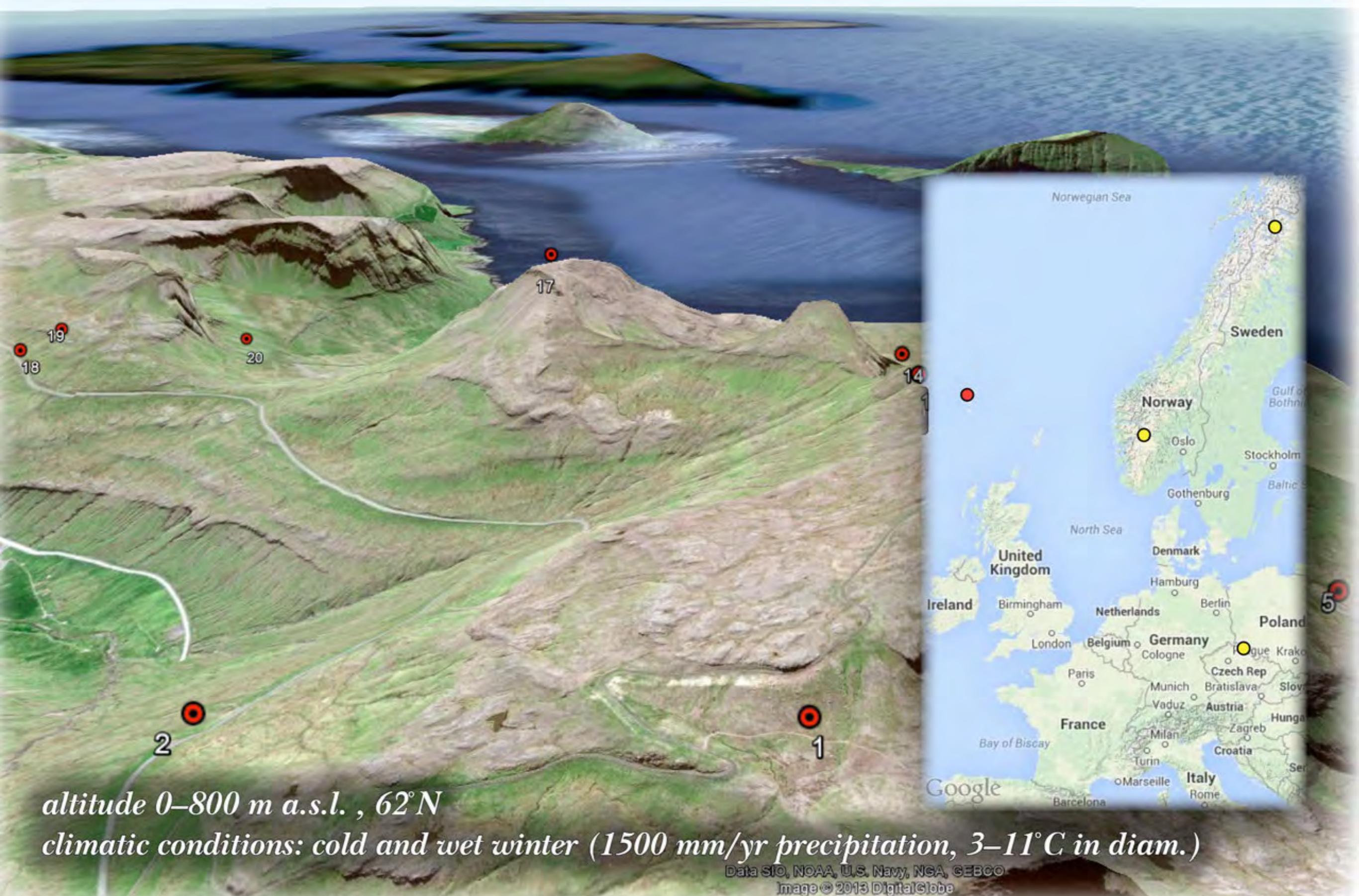
*Pertusaria glomerata*

*dominating lichens of alpine tundra in South Siberia*



*Rhizoplaca chrysoleuca*

# *lichens of alpine tundra of Faroe Islands*



*altitude 0–800 m a.s.l. , 62°N*

*climatic conditions: cold and wet winter (1500 mm/yr precipitation, 3–11°C in diam.)*

*lichens of alpine tundra of Faroe Islands*



*Protopannaria pezizoides*

*lichens of alpine tundra of Faroe Islands*



*Thamnolia vermicularis*

*lichens of alpine tundra of Faroe Islands*



*Lecidoma demissum*



*lichens of alpine tundra of Faroe Islands*



*Massalongia carnosa*

*lichens of alpine tundra of Faroe Islands*



*Sphaerophorus fragilis*

*lichens of alpine tundra of Faroe Islands*



*Solorina crocea*



*Thanks for Your attention :)*