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Peat bog and alluvial deposits reveal land degradation during 16th and 17th century colonisation of the western Carpathians (Czech Republic)

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Table S1. Summary of the pollen stratigraphy, chronology, vegetation history and evolution of the Girová peat bog and its surroundings.

| LPAZ, dominant taxa depth (cm) | Age (cal a BC/AD) | Pollen and microfossil record description | Interpretation of the peat bog slope system evolution |
|---|----------------------|--|---|
| G-1 <i>Abies-Fagus</i> 120-90 | 180 BC–0 AD | The main tree pollen include <i>Abies alba</i> Mill. (49.5 %) and <i>Fagus sylvatica</i> L. (13.8 %). The pollen curves of <i>Tilia</i> (3.9 %), <i>Quercus</i> (5.1 %), <i>Acer</i> (6.4 %), <i>Carpinus betulus</i> L. (3.1 %), <i>Fraxinus</i> (2.3 %) and <i>Ulmus</i> (2.9 %) begin to close at the end of this zone. The herbs are represented by the pollen of Apiaceae and spores of fern (<i>Filicales monoletae</i>). Grains of <i>Artemisia</i> , <i>Ranunculus</i> , Chenopodiaceae, Cichoriaceae (<i>Taraxacum</i>), <i>Silene vulgaris</i> (Moench) Garcke, <i>Urtica</i> , <i>Rumex acetosa/acetosella</i> and <i>Plantago major L./media L.</i> indicate the presence of humans. Damaged pollen and soil fungi such as <i>Microthyrium microscopicum</i> are present in all samples, moreover, <i>Trichuris trichiura</i> (intestine parasite, hosted by man and pigs) was found. | The formation of the peat bog followed the waterlogging of the depression as indicated by <i>Caltha palustris</i> L., <i>Mentha longifolia</i> (L.) Huds., <i>Menyanthes trifoliata</i> L. pollen and <i>Thelypteris palustris</i> (A.Gray.) Schott. spores. The presence of <i>Sphagnum</i> spp. spores may point to the existence of sphagnum-moss patches. The surroundings of peat bog comprise natural dense forest. Minor grazing activities appeared in the peat bog vicinity. |
| G-2 <i>Abies-Pinus</i> 90-67.5 | AD 1500–1640 | The pollen levels of <i>Abies</i> (59 %) attain a maximum; the percentage of <i>Fagus</i> falls to 1.4 %. Deciduous trees pollen content decreases suddenly. Herbs pollen levels are low, reaching 4.5 %. The fungi (<i>Glomus</i> , <i>Microthyrium</i>), sporangium of ferns, stomata of Pinaceae, amoebae fauna (<i>Centropyxis aculeate</i> Ehrenberg, <i>Arcella catinus</i> Penard) and damaged pollen are more abundant. Pollen concentrations are reduced. A minor increase in primary anthropogenic indicator <i>Cerealia</i> can be traced at the top of the unit. | Radiocarbon results suggest erosional loss of the sequence at the bottom of the unit. Presence of microfossils such as <i>Glomus</i> , damaged pollen, and reduced pollen concentrations indicate marked slope erosional events and enhanced deposition in the peat bog. The occurrence of hydrophilic amoebae indicates the temporary flooding of the peat bog. Increase in <i>Cerealia</i> indicates the establishment of farming probably in lower-lying areas of the catchment. |
| G-3 NAP- <i>Abies-Pinus</i> 67.5-15 | AD 1640–1870 | The proportion of <i>Abies</i> pollen slowly decreases to 13.4 %, while NAP increases to 50.4 % with significant increases in Cyperaceae (34.4 %), Poaceae (14.1 %), <i>Silene</i> (8.4 %), <i>Artemisia</i> (1.9 %), Cichoriaceae (2.2 %), <i>Ranunculus</i> (2.7 %) and other herbs connected with cereal farming (<i>Cerealia</i> undif. pollen, <i>Avena</i> , <i>Triticum</i> and <i>Secale</i> , <i>Fagopyrum</i> , <i>Cyanus segetum</i> Hill, <i>Polygonum aviculare</i> L.). The pollen of <i>Plantago lanceolata</i> L., <i>Rumex acetosa/acetosella</i> , <i>Plantago major/media</i> and <i>Urtica</i> are present throughout. At the beginning and the end of the zone a short-term increase in <i>Betula</i> pollen is also identified. In the sediments of this zone the diatom algae, <i>Pediastrum boryanum</i> , <i>Sphagnum</i> spores and testate amoebae (<i>Centropyxis aculeata</i> , <i>Arcella catinus</i>) appear, the content of spores decreases, sporangium are absent and stomata of Pinaceae are sporadic. | The abrupt NAP increase indicates deforestation of the peat bog surroundings. Anthropogenic indicators in the pollen spectra reflect establishment and continuous expansion of pastures and arable land. The occurrence of phytoplankton, testate amoebae and <i>Sphagnum</i> indicates wetting of the peatbog. An episode of abrupt accumulation due to enhanced slope sheet erosion is indicated at 47.5–40 cm by the increase in clay content, damaged pollen and presence of <i>Glomus</i> . In the upper part of the unit, increasing anthropogenic impact on the vegetation is noted by rise in NAP. At the top of the unit, NAP decreases and the abrupt rise in <i>Betula</i> pollen indicates end of grazing activities and the abandonment of pastures. |
| G-4 <i>Picea</i> 15-0 | AD 1870– present | Pollen assemblages are characterised by the increase in <i>Picea</i> (54.3 %) and <i>Abies</i> (33.1 %). The NAP curve decreases to 2.5%. <i>Algae</i> disappear in this unit. The pollen of anthropogenic indicators disappear in upper samples and the values of fern spores and Pinaceae stomata increase. | The pollen record reflects the continuous human-induced afforestation by spruce monocultures documented from the 19th century in the peat bog surroundings. The disappearance of <i>Algae</i> in the profile indicates the drying of the peat bog which is also suggested by the peak in the Fe/Mn ratio at the bottom of the unit. |