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Anthropogenic and climatic signals and Holocene environmental history of the Bottomless Lake (Tăul Fără Fund) Sphagnum peat bog, Băgău, Romania

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This work focuses on the paleoenvironmental and paleoclimatological analyses of the undisturbed core sequence of 8.6 meters extracted from the Bottomless Lake (Tăul fără fund) sphagnum peat bog located in Băgău, Romania. Based on the loss on ignition method and with the help of the radiocarbon dating it was possible to reconstruct the climatic factors and anthropogenic impacts on the local environment in the last 8600 years. The sedimentation rate correlates with the development of the peat bog, and the peat accumulation correlates with the local climatic factors, especially with the humidity. It has above 90% organic matter content all along excluding the erosion horizons. Apart from the Holocene environmental-climatic conditions, and apart from the extraordinary events, such a dry and hot climate did not develop in the examined region, which could dry out the trees in the valley and replace it with herbaceous steppe or forest steppe vegetation. Therefore, we assume that the increase of the erosion could be caused by producing human activity. The carbonate content highly correlates with the non-organic matter content, due to the bedrock being Tortonian clayey and silty sediment with high carbonate content. The formation of the valley started with occlusion and non-organic sediment accumulation, and it slowly evolved into a peat bog. After each erosion level the peat bog successfully regenerated and kept high organic matter content until another erosion happened. Two water layers were formed during the Bronze Age and the Middle Ages. When the overall temperature got cooler, the vegetation period cooled down, and it decreased the evapotranspiration. As a result of the cool and wet climatic conditions the water table of the peat bog increased. Therefore, the central lake system extended, and a water layer formed. The peat accumulation commenced by developing a new floating mat on the lake surface.