

Abstract

This work aims to clarify and describe the necessary conditions of the peat soil horizon formation. The following three types of locations were compared. Drained locations that were revitalized afterwards. Locations which were drained and never revitalized. And lastly undrained localities where the original peat horizons are still presented. It has been proven that the groundwater level differs in drained and undrained areas. However, there was no significant difference between revitalized and non-revitalized areas in drained types of locations. The results confirmed that *Sphagnum spp.*, which is the most important species in peat formation, dominates the plant community where the groundwater level is higher than 25 cm. If the groundwater level is lower than 25 cm below the surface, *Sphagnum spp.* disappears very quickly and degrades peat soil horizons. The work also proved the groundwater level directly affects plant communities that more or less promote carbon accumulation in the soil but water level and anaerobic conditions have no direct affect on soil carbon accumulation and only affect the vegetation composition of the peat soil horizon.