



Function of peatland located on secondary transformed peat-moorsh soils on groundwater purification processes and the elution of soil organic matter

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The investigation of peatland is used to show the water quality functioning with respect to different forms of nitrogen and carbon. The purification of ground water by the transect of 4.5 km long consisting organic soils (peat-moorsh soils) was estimated. This transect is located in the Agroecological Landscape Park in Turew, 40 km South-West of Poznań, West Polish Lowland. There is this transect along Wyskoć ditch. pH, the contents of total and dissolved organic carbon, total nitrogen, N-NO_3^- , N-NH_4^+ was measured. Additionally C/N factors of peats were estimated. The investigation has shown the impact of the peatland located on the secondary transformed peat - moorsh soils on the lowering of total nitrogen, ammonium, and nitrates as well as total and dissolved organic carbon in ground water.

Peat-moorsh soils were described and classified according to Polish hydrogenic soil classification and World Reference Base Soil Notation. There are these investigated points along to Wyskoć ditch. Two times a month during entire vegetation season the following material was taken from four chosen sites marked as Zbechy, Bridge, Shelterbelt and Hirudo:

- samples of peat, from the depth of 0-20 cm,
- samples of water from the ditch,
- samples of ground water from wells established for this investigation.

Samples of peat-moorsh soils were collected at the depth 0-20 cm. Soils were sampled two times a month from 10 sites of each site. Samples were air dried and crushed to pass a 1 mm-mesh sieve. These 10 sub-samples were mixed for the reason of preparing a “mean sample”, which used for the determination of pH (in 1M KCl), dissolved organic carbon (DOC), total organic carbon (TOC), total nitrogen (N_{total}), and N-NO_3^- as well as N-NH_4^+ .

In water from Wyskoć ditch pH, N_{total} , N-NO_3^- , N-NH_4^+ , DTC (dissolved total carbon) and DOC (dissolved organic carbon) was measured.

Ground water samples were collected from four wells established for this investigation. The water was filtered by the middle velocity separation and pH, N-total, N-NO_3^- , N-NH_4^+ , DTC (dissolved total carbon) and DOC (dissolved organic carbon) were measured.

Peatland located on the secondary transformed peat - moorsh soils has revealed the lowering in ground water: nitrates 38.5%, N-organic 10%, N-total 24.5%, ammonium 38.7%, dissolved total carbon 33.1%, dissolved total inorganic carbon 10%, and dissolved organic carbon 57.5%.

The dissolution of soil organic matter from peat-moorsh soils in broad range of pH and ionic strength was investigated. The rates of the reaction were calculated from the kinetics of first order reaction model. The investigations have shown the impact of the properties of secondary transformed peat-moorsh soils on the rates of the dissolution of organic matter.