

## Characterization of peat humic acids modification during the peat formation process using the HSQC NMR

Malgina E.<sup>1</sup>, Bogolitsyn K.<sup>1</sup>, Faleva A.<sup>1</sup>, Kozevnikov A.<sup>1</sup>, Kosheleva A.<sup>1</sup>, Sobolev N.<sup>1</sup>

<sup>1</sup>Northern (Arctic) Federal University named after M. V. Lomonosov, Arkhangelsk, Russia, n.sobolev@narfu.ru

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<sup>1</sup>D NMR spectrometry is a powerful tool for characterization of the humification process occurring in the bog ecosystem and for analysis of its dynamic. However, there are some limitations of the mentioned method in analysis of the randomized polymeric mixture such as humic acids (HA). The peak overlapping is one of the main problems. To avoid this limitation 2D NMR spectrometry method is nowadays widely used. Application of this technique to the HA analysis enhance the information value of the analysis results.

In the present study 2D NMR experiment was conducted for the characterization of the peat HA modification through the peat core. For this purpose, HA were isolated from each of 7 layers (from 0 to 375 cm depth) of peat according to [1]. Then, 50 mg of the extracted HA was dissolved in 600  $\mu$ L of d<sub>6</sub>-DMSO and further analyzed using 600 MHz Bruker Avance III NMR spectrometer. <sup>1</sup>H–<sup>13</sup>C heteronuclear single quantum coherence (HSQC) spectra were collected.

An example of HSQC spectrum (one of the 7) presented on Fig. 1. All obtained spectra can be separated on 4 main regions. For region A decreasing of the fatty and amino acids signal was observed with the increasing of the layer's depth. In aliphatic region B the dynamic of carbohydrate increasing up to the maximum on the layer 35-85 cm was found. Also, in region B tyrosine and phenylalanine amino acids were determined. We faced with difficulties in the interpretation of the results in aliphatic region C due to the intense signal of the internal standard, which will be removed in further experiments. For aromatic region D the decreasing of the well resolved signal of the aromatic compounds was observed.

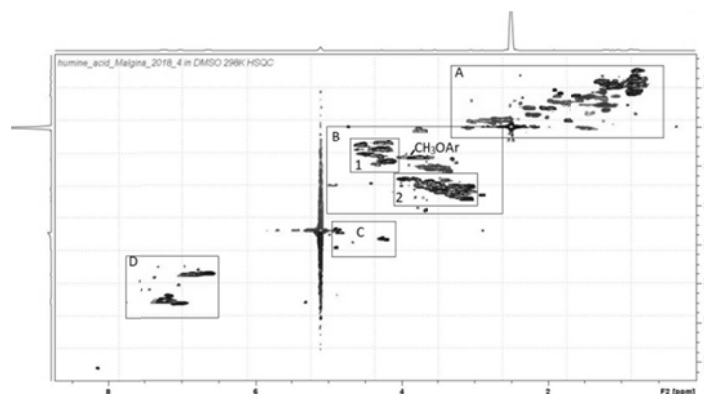


Figure 1. HSQC spectrum of HA isolated from peat layer 35-85 cm

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### References

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