THE EXAMINATION OF HUMIC SUBSTANCES IN SOILS AND COMPOSTS WITH HIGH ORGANIC CONTENT WITH DIFFERENT METHODS

VIKTÓRIA LABANCZ[1], GABRIELLA RÉTHÁTI[1], ANDRÁS MAKÓ[2], TAMÁS SZEGI[1]

[1]Szent István University, Department of Soil Science and Agricultural Chemistry, Gödöllő, Hungary
viktoria.labancz.91@gmail.com, rethati.gabriella@mkk.szie.hu, szegi.tamas@mkk.szie.hu
[2]Institute for Soil Sciences and Agricultural Chemistry, Centre for Agricultural Research, Hungarian Academy of Sciences, Budapest, Hungary
mako.andras@agrar.mta.hu

The organic materials, especially the complex structural humic substances are acid-characteristic polymerswhich are key elements of soils. Despite their relatively small quantity, humic substances have beneficial effects on soil nutrient management, development of optimal soil structure, regulation of soil temperature, and proper water management.

The application of the UV-VIS spectrophotometry for describing humic substances in soils and determining of humifical state is nowadays a widespread method. The E_4/E_6 procedure (which were determined between 465 and 665 nm wavelength) and the Hargitai-method (the extinction of extracts measured between 400 and 750 nm at 9 wavelength) are procedures that have become the general tool for determining the quality of humic matters because of its easy accessibility and smaller need ofinstrumentations. Nevertheless, their usefulness has been criticized in scientific communities because of the highhuman error factor and the technical limitations of the simpler spectrophotometric instruments. Nowadays the spreading light scattering photometric examinations using lasers as the Static Light Scattering (SLS) or the Dynamic Light Scattering (DLS) could be a new way of measuring the quality of the humic matters.

This study is based on the examination of different quality soil and compost samples which were extracted from different Hungarian sites like Trizs, Szárítópuszta and Csobánc. Additionally, not only the soils and composts were analyzed but also any soil conditioners (biochar, bone charcoal) which were applied and affected their properties.

The main goal of the research was to measure the soil and compost samples with the E_4/E_6 and the Hargitai-method and with also using Zetasizer Nano ZS

device that could lead to more detailed results about the weight and the size of the humic molecules.

Based on the summarized analytic results the outcomes of the E_4/E_6procedure is applicable for drawing relevant conclusion regarding the humic quality of the given sample. On the contrary, the applied Hargitai-method has not proved to be effective. Although the measurement of the molecule's size and weight with the Zetasizer Nano ZS device has brought out exciting results and displayed similarities with the E_4/E_6 outcomes, only it's tendencies proved to be informative because of its methodological background.