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Studies of the influence of humic acids on sorption and ion-exchange properties of high moor peat

T. Gierlach-Hladon (1), L. Szajdak (2)

1. Poznan University of Medical Sciences, Poland, e-mail: thladon@amp.edu.pl
2. Research Center for Agricultural and Forest Environment, Polish Academy of Science, Poznań, Poland, e-mail: szajlech@man.poznan.pl

The conversion of vegetable matter to peat is a process whose continuation leads to the formation of lignite, coal and anthracite. During peat formation, humification of organic substances takes place. The variations in peat arise from the variety of plants whose residues contribute to peat formation, and from the environmental conditions in which humification takes place. Peat comprises relatively unstable substances, whose reactivity contributes to its usefulness. Peat is characterized by colloidal behavior, and by irreversible loss of wettability, produced by drying.

In peats, the process of humification is essentially halted at an early stage by conditions hostile to further biological activity. Thus the chemical interpretation of the mixture of extractable organic compounds which comprise humic substances is more complex than with mineral soils, insofar as the first major change in peat, i.e. partial humification, appears to be more rapid than succeeding transformations. Humic acids are usually regarded as polymers of aromatic compounds and there is little doubt that aromatic structures are incorporated in the complex. The physical-chemical properties of humic compounds are depended on chemical composition and molecular structure of these substances.

The aim of the study was to evaluate the physico-chemical properties of humic acids isolated from high moor peat of different genesis and use for medical therapy.

Studies of humic acids have been performed by using analytical techniques as fol-

lows: X – ray diffraction, differential scanning calorimetry, paper electrophoresis, low-temperature nitrogen adsorption, particle size distribution by laser light scattering.

The results showed that a clear isolation of humic acids from high moor peat was reached up 85% of the total amount of humic acids. X-ray analysis, thermal analysis (DSC) and IR spectroscopy of central fraction of humic acids demonstrated significant differences of chemical properties of humic acids isolated from high moor peat of different nature. The investigations carried out by low-temperature nitrogen adsorption and desorption characterized the surface area, the porosity and pore volume. Using scattered laser radiation the size of acid molecules was estimated. No significant differences of the values determining the texture of humic acids among central fraction of humic acids and those extracted from non-separated humic acids were measured.