

To what extent is the geochemistry of curative mud in Estonia satisfactory?

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Curative mud, also known as therapeutic mud, has been used for centuries in various European countries for its health benefits. Estonia, with its unique geological and geomorphological characteristics, has several important deposits of lake and marine curative mud that offer both public health and commercial benefits. The five active deposit areas in Estonia are the Haapsalu Bay, the Käina Bay, the Mullutu-Suurlaht Bay, the Värskaa Bay (Lake Peipsi), and the Ermistu Lake.

In 2022, the first stage of the curative mud control study aimed to determine and map the condition of Estonian curative mud deposits. To assess the current pollution levels of curative mud, the study mapped the spatial distribution of the lithological composition of the mud, as well as hazardous substances in the surface sediments of Estonian curative mud deposits. The study also compared its results with earlier investigations, as well as with Estonian and international reference values for soils and sediments.

The Värskaa curative mud deposit had the highest organic content (37.3%), while the Käina curative mud deposit had a high mineral content (92.3%). The results of the heavy metal analysis confirmed that the concentrations of heavy metals found in all three curative mud deposits were within permissible limits. The content of petroleum products in the Haapsalu Bay was on average 42 mg/kg, while in the Värskaa Bay it was 118.6 mg/kg dry weight (the Käina Bay curative mud was below the detection limit). Pesticides were found in five samples from the Värskaa Bay (in other samples were below the detection limit). The concentration of phenolic compounds in all three deposits was below the detection limit, except for the Värskaa Bay (4-methylphenol).

Further work will be devoted to establishing the structure of the mineral matrix of the muds, to better understand the significance of increased concentrations of some heavy metals, as well as to analyze the chemical nature of the organic compounds present in the muds and their correlation with the curative properties of the muds.

