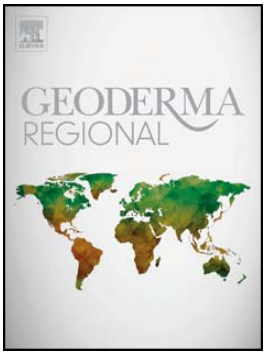

Clay minerals of Pliocene deposits and their potential use for the purification of polluted wastewater in the Sohag area, Egypt

Yasser Refaey, Boris Jansen, Abdel-Hamid El-Shater, Abdel-Aziz El-Hadad, Karsten Kalbitz

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Clay minerals of Pliocene deposits and their potential use for the purification of polluted wastewater in the Sohag area, Egypt.

Yasser Refaey[a, b,*], Boris Jansen[a], Abdel-Hamid El-Shater[b], Abdel-Aziz El-Hadad[b], and Karsten Kalbitz[c]

[a] *Institute for Biodiversity and Ecosystem Dynamics (IBED), University of Amsterdam, P.O. Box 94240, 1090GE, Amsterdam, The Netherlands.*

[b] *Geology Department, Faculty of Science, Sohag University, P.O. Box 82524, Sohag, Egypt.*

[c] *Soil Resources and Land Use, Institute of Soil Science and Site Ecology, Faculty of Environmental Sciences, Technical University Dresden, Pienner Strasse 19, 01737 Tharandt, Germany.*

[*] Corresponding author e-mail address: (y.b.refaey@uva.nl).

Abstract

In our study we investigated the clay fraction composition of Pliocene clay deposits in the Sohag area, Egypt. Our goal was to obtain insights into the origin of the deposits, and to assess their potential for use in inexpensive wastewater purification. Rationale for the latter was that in Egypt both industrial wastewater and irrigation water are often polluted with heavy metals (HMs), the load of which can be significantly reduced using the Pliocene clay. We combined physico-chemical analyses with detailed X-ray diffraction (XRD) mineralogical investigations and Specific Surface Area (SSA) measurements of samples from 16 locations in four areas containing Pliocene clay deposits. The grain size distribution of the studied samples was dominated by silt (75-89 %) with lower quantities of clay (6-20 %) and sand (2-15%). Neither grain size distribution nor the distribution of individual clay minerals varied between the tested samples, suggesting they all originate from a single source area. The effect of differential cation saturation (K^+ and Mg^{2+}) and differential heat treatments