

**CLAY MINERALOGY OF CERTAIN GREAT SOIL
GROUPS IN RELATION TO SOME SOIL
CHARACTERISTICS**

By

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B.Sc., Agriculture Science (Soil Sci.), Ain Shams Univ., 1983
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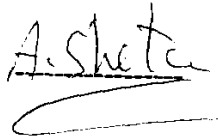
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ABSTRACT

CLAY MINERALOGY OF CERTAIN GREAT SOIL GROUPS IN RELATION TO SOME SOIL CHARACTERISTICS. Unpublished Doctor of Philosophy in Agriculture, University of Ain Shams, 1996.

The aim of this investigation is to study the mineralogical composition of clay fractions in some great soil groups in Egypt namely, Torrtts, Calciorthids, Gypsiorthids and Torrifluvents. Special interest was directed on the identification, formation and types of interstratified layer silicates and intergradient clay minerals.

Sampling locations were selected according to the pedogenic map of Egypt and Land Master Plan to represent the common great soil groups in and outside the Delta region.

The mineralogical composition of clay fractions in each great soil group was identified and discussed in relation to their physical, chemical and morphological characteristics. Some soil characteristics such as, soil moisture characteristics, soil hydraulic conductivity and shrink-swell potential were estimated and discussed in relation to the clay mineralogical composition of these great soil groups.

In order to identify the exact member of interstratified species, detailed X-ray diffraction analyses were conducted on some clay samples saturated with different cations, i.e., Na, Mg, K, Ca, Li solvated with either ethylene glycol or glycerol and heated to different temperature, 110, 180, 350, 500, 550 and 600°C. Each interstratified mineral species was identified according to its respective d-spacing.

The identified species are:

Regular interstratified illite-smectite, regular interstratified chlorite-smectite, regular interstratified chlorite-vermiculite, random interstratified smectite-vermiculite, and the intergradient minerals(chloritized montmorillonite and chloritized vermiculite).

Some of the above-mentioned interstratified species identified by X-ray diffraction were examined by D.T.A. for further confirmation.

Some soil physical properties such as moisture characteristics, COLE and hydraulic conductivity were estimated and correlated with the clay content and clay mineral composition of some representative samples for the studied Great Soil Group.

Key words: Interstratified minerals, Intergradient minerals, X-ray diffraction analysis, Great soil groups, Clay mineralogical composition.

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