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Genesis and Evolution of Black Soil in the Eastern Mediterranean

Hussam Hag Mohamed Husein, Wahib Sahwan, Bernhard Lucke, and Rupert Bäumler

FAU Erlangen-Nuremberg, Institute of Geography, Germany (hussamhhusien@gmail.com)

Abstract

Knowledge about the genesis and evolution of black soils in the Eastern Mediterranean is vital for sustainable land management as well as for revealing the current and past climate conditions that were decisive for their evolution and development. Hence, it is important to study this type of soil as it only occurs very rarely in the semi-arid region. Answers on the conditions of formation and type of paleoclimate that prevailed during its development can be found in the surrounding environment. In this study, the black soils that currently occur in the Eastern Mediterranean were analyzed in different bioclimatic zones and were found to genetically belong to two soil types: 1-Calcareous black soil (Proper Rendzina-Typic Rendolls), 2-Hydromorphic black soil (Haploxerolls). The impact of the relief was obvious on both thickness of the solum and the mollic horizon. Proper Rendzina (Typic Rendolls) occurs on toe slopes and feet slopes, Para-Rendzina (Lithic Rendolls) on shoulders and Chernozems on a flat plain. Regarding the Rendzina, the color reflects the origin of the prevailing parent material from which they are derived: Proper Rendzina forms on limestone, chalk, sandstone, conglomerates, and claystone; Reddish Rendzina on Dolomite and hard limestone, and Grayish Rendzina on Serpentine. It was also found that the Hydromorphic black soils (Haploxerolls, Calcic Chernozems) only occur on calcic marl and lacustrine deposits under saturation conditions and bad drainage in the depressions that formed by the Dead Sea faults. The soil has a thick dark mollic horizon with a high content of organic matter.

Keywords: semi-arid, black soil, Rendzina, Chernozems, eastern Mediterranean.