

Effects of Topography and Land Use on the Soil Magnetic Susceptibility, Case Study: Madvan Plain, Kohgilouye Province

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(Received: July 29-2012 ; Accepted : July 3-2013)

Abstract

Topography and land use are among the most important factors affecting the soil formation. Chemical forms of Fe and magnetic susceptibility (χ) are widely used for the evaluation of soil development. This study was conducted in order to determine the effect of these factors on χ . A toposequence was selected in Madvan Plain, Northern Yasouj. Nine soil profiles (paddy and dryland soils) were dug and sampled from diagnostic horizons. Magnetic susceptibility was measured by Bartington Dual Frequency, MS2 Meter at frequencies of 0.46 and 4.6 KHz. Results indicated that less amounts of χ , frequency dependence of χ ($\chi_{fd}\%$) and CBD extractable Fe (Fe_d) (3.1, 2.6 and 2.7 times, respectively), and more quantities of oxalate extractable Fe (Fe_o) and Fe_o/Fe_d ratio (5 and 7.2 times, respectively) were measured in paddy soils. The highest value of χ was observed in pedons located on plateau and piedmont plains, and the lowest belonged to those located on river terraces with aquic conditions. Compared to paddy soils, χ enhancement at soil surface was greater (17%) in dryland soils. A positive correlation existed between χ and some soil characteristics such as Fe_d , clay content and $\chi_{fd}\%$.

Keywords: Fe oxide, Topography, Magnetic susceptibility, Paddy soil.

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