



University of Zabol

Faculty of Water and Soil

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**The Thesis Submitted for the Degree of M.Sc (in the field of Soil Resource Management
- Soil Resource and Land Evaluation)**

Title

Paleopedological study of Hormak region paleosols, in Southeastern of Iran

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Abstract

Paleosols are soils that are formed in the past, but are buried by younger deposits such as loess, glacial transported sediments and alluvial deposits and therefore, can be used to provide different data and information about paleoclimate and paleoenvironment. Therefore, the aim of this research is paleopedological study of a paleosol to reconstruct the paleoenvironment in Hormak area north of Zahedan city in Sistan and Baluchestan province. For this purpose, after field study, soil samples were taken from each paleosol layers. Laboratory analyses for soil texture, electrical conductivity, pH, CCE and clay mineralogy were done and thin section preparation were performed for soil micromorphological studies. The results of physico-chemical analyses and soil micromorphology confirm the presence of the Argillic horizon with a thickness of about 300 cm. The results of clay mineralogy experiments showed that smectite was the predominant mineral of this paleosol, followed by illite, chlorite, quartz and vermiculite. Smectite appears to be pedogenic predominantly and it is mostly of slightly inherited origin. The results of soil micromorphological studies confirmed the field findings in terms of structure and diagnostic horizon of Argillic identification. The paleosol b-fabric was speckled. Clay coatings, carbonate nodules, and iron and manganese oxides nodules were the most pedofeatures. The results showed that the paleosol was polygenetic soil that has developed through the several different climatic and soil formation periods. According to the results, it seems that this paleosol, which belongs to the late Oligocene serie, (Chattian stage), was formed in different conditions from the current conditions of the region in terms of climate (more rainfall) and better vegetation (forest).

Keywords: Paleoenvironment, Paleoclimate, Soil micromorphology, Clay mineralogy