

Environmental Conditions of Iran Pluvial Lakes using Sedimentary Evidence (Case study: Lut Desert Kalut)

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Extended abstract

Introduction

Iran Kaluts (Yardang) which are considered as special models in terms of magnitude and extension have been shaped in the west part of the central Lut desert. Although these Kaluts now are influenced by the selective windy erosion, they can be shaped through the process of wind and water erosion. The suitable environment for formation of these Kaluts are the arid region together with little raining and the intensive and continuous wind. The Lut desert Kaluts are shaped in the grounds with finer structure and wind and water erosion. This erosion can be produced when the water is accumulated in the small pit and holes in the humid season after temporary precipitation in the desert. Then, a doughy substance is made and wakened. After drying and as a result of the predominant wind on the district, these pit and holes gradually become enlarged and the long silts produce the Kaluts. In this research, we want to study the sedimentary characteristics of the Kaluts and Iran pluvial lakes by sampling of one of the high Kaluts in Lut desert through sedimentary and granulometry experiences on these samples.

Materials and Methods

Firstly, through an extensive survey in the district and visual examination of Kaluts, a high Kalut of the district was selected for modeling. After recording the exact position of Kalut by GPS, the related Kalut was sampled. The taken samples crushed in geomorphology laboratory

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and sieved by shaker. Those samples that were under 63 micron were separated in 10 grams and were used in granulometry test in Pipette way and scaled graduated cylinder. This sampling was done in two days (8 samples for the first day and 2 samples for the second). After sampling in the specific time and in the specific depth of cylinder, the samples were dried and the remained sedimentary samples were weighted in the beakers. Thirdly, the GradiStat software was used to analyze the number gained from the pipette test and figures were drawn.

Results and Discussion

After testing 15 layers taken from the Kalut, granulometry elements of particles such as the context and the size of particles near to the average, qualitative and quantitative measures of Sorting, Skewness and Kurtosis of the particles were identified by the GradiStat statistical software and by statistical relationship between Folk and Ward (1975). The gathering center of bimodal and Unimodal aggregation show very poorly sorted sediments. This position could be observed in most of underneath layers. This could be produced by shaping sedimentary in the specific context that could create different particles with different sizes. According to the obtained results from statistical and experimental analysis, the context of all layers in Folk triangles was determined as muddy and their particles as the rate of silt and clay. It was expected that the Skewness of all layers was positive and the results show that most of the layers have positive title to fine and very fine particles.

Conclusion

Iran kaluts are unique example of the magnitude and extent of desert areas. Although these Kaluts are affected by wind erosion, but water and wind erosion processes are involved in their formation simultaneously. In this study, after sampling from a Kalut with 33 meters high and 15 layers, these sediment samples were transferred to the laboratory and examined by granulometry tests. The results of this study revealed that the Kalut sedimentary samples in the rate of silt and clay have horizontal and lamination classification. This refers to this fact that the tiny sediments hanging in the water were deposited in a calm environment. Furthermore, on the muddy silts some chaps were observed. The silts were produced when the lakes were dried and the water was vaporized severely and then the sediments could be observed in the form of salty and chalky layers of Kaluts along with silt and clay particles carried by the wind. This fact can be certified with respect to this fact that in the past the shallow lake was severely vaporized and dried in the low energy environment. As a result of this, the chalky and salty layers were made. Based on the experiments, most of the related layers have the muddy context with very bad sorting and fine skewness. This reveals that the following activities in the district were low and the environment was low energy during sedimentation of the kaluts.

Keywords: *Gradistat, granulometry, Kalut, Lut Desert.*