



## **The Climate and its Impacts on deterioration and weathering rate of EI-Nadura Temple in El- Kharga Oasis, Western Desert of Egypt.**

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Undoubtedly, El-Kharga Oasis monumental sites are considered an important part of our world's cultural heritage in the South Western Desert of Egypt. These sites are scattered on the floor of the oasis representing ancient civilizations. The Roman stone monuments in Kharga represent cultural heritage of an outstanding universal value. Such those monuments have suffered weathering deterioration. There are various elements which affect the weathering process of stone monuments: climate conditions, shapes of cultural heritages, exposed time periods, terrains, and vegetation around them, etc. Among these, climate conditions are the most significant factor affecting the deterioration of Archeological sites in Egypt. El- Kharga Oasis belongs administratively to the New Valley Governorate. It is located in the southern part of the western desert of Egypt, lies between latitudes 22°30'14" and 26°00'00" N, and between 30°27'00" and 30°47'00" E. The area of El Kharga Oasis covers about 7500 square kilometers. Pilot studies were carried out on the EI-Nadura Temple, composed of sandstones originating from the great sand sea. The major objective of this study is to monitor and measure the weathering features and the weathering rate affecting the building stones forming El-Nadura Roman building rocks in cubic cm. To achieve these aims, the present study used analysis of climatic data such as annual and seasonal solar radiation, Monthly average number of hours of sunshine, maximum and minimum air temperatures, wind speed, which have obtained from actual field measurements and data Meteorological Authority of El-Kharga station for the period 1977 to 2010 (33 years), and from the period 1941-2050 (110 years) as a long term of temperature data. Several samples were collected and examined by polarizing microscopy (PLM), X-ray diffraction analysis (XRD) and scanning electron microscopy equipped with an energy dispersive X-ray analysis system (SEM-EDX). The results were in agreement with the observed values in the study area. The deterioration of El-Nadura temple is above 45