

An evaluation of the role of bacterial activity in the weathering of natural building stones

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Bacterial weathering, a subdivision of biological weathering, which plays a significant role in rock weathering, has increasing importance recently. Although there are a limited number of studies conducted on this topic, with the help of rapid improvement of Geomicrobiology, several studies gain pace. However, because of the wide variety of both bacterial species and rock types, duration of biological weathering processes on mineral and rock samples and preferred minerals has not yet fully understood. There has not been any study carried on bacterial weathering until now in Turkey. Based on these reasons, in this study, there conducted a study on two species of bacteria actively contributing to rock weathering and their interaction with three rock types used as building stone in our country. Granite, andesite, and limestone samples interact with *Bacillus Subtilis* and *Bacillus Pumilus* species of bacteria in sterile, isolated closed system reactors. There obtained data from samples analysed by SEM monitoring method about morphological features and chemical change. Chemical analyses determine bacteria preferred elements. By comparing RGB measurements, there held a study on colour index change. With the help of rock mechanics laboratory experiments, the impacts of bacteria on rock physical properties are also determined. The porosities of granite and andesite samples tested in both bacteria solutions without nutrient broth (NB) were increased as well as the values of limestone samples were decreased. The strength values of samples, generally, were decreased in the solutions with NB and without NB. Finally, all data are put together, and it has found out that *Bacillus Subtilis* species are more aggressive on limestone and andesite whereas *Bacillus Pumilus* are more aggressive on granite. During the experiment, by the continuous measurement of daily absorbance values, there determined both the optimum life cycle of bacteria and the impact of varying physical circumstances in this situation be determined.