

A Geomicrobiological Study of a Phosphate-Ore Mine in Al Jalamid, Saudi Arabia

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Phosphate ore is a rich source of elements, an important economic natural resource with a great use in agricultural and chemical industry. In addition, radioactive elements and heavy metals contents in phosphate rocks varies widely according to the geologic structure of the mining area. This work was set out to compare microbial communities associated with phosphate rocks in different geologic and textural profiles, accordingly 3 representative phosphate rock samples has been collected from the upper (waste), middle (soft) and lower (hard) core of a phosphate-ore mine located in Al Jalamid at the north of Saudi Arabia. X-ray diffraction (XRD) and X-ray fluorescence (XRF) were applied to determine the chemistry of the rocks. The dominated crystal structure for upper layer was Calcite-Ca(CO₃) while Dolomite-CaMg(CO₃)₂ and Quartz-SiO₂ were in middle and lower layers, respectively. At the other hand, Phosphate concentration researched elevated level at 3.12%, 7.66% and 3.92%, of the which of whole content, for the upper, middle and lower layers, respectively. Microbiome inhabiting the phosphate-ore samples were determined using next generation sequencing (454 pyrosequencing). The most dominated species were *pseudomonas putida* with percentage of 46% and 50% for both the upper and middle layers, respectively, while *amycolatopsis palatopharyngis* (51%) for lower layers.