

Abstract: This study investigated the bioremediation of heavy metal-contaminated soil using a consortium of indigenous microorganisms. The results showed that the consortium significantly reduced the concentration of heavy metals (lead, cadmium, and chromium) in the soil over a period of 30 days. The bioremediation process was monitored using various parameters, including pH, electrical conductivity, and the concentration of heavy metals. The results indicated that the consortium was able to reduce the concentration of lead by 80%, cadmium by 70%, and chromium by 60% in the soil. The bioremediation process was also monitored using various parameters, including pH, electrical conductivity, and the concentration of heavy metals. The results indicated that the consortium was able to reduce the concentration of lead by 80%, cadmium by 70%, and chromium by 60% in the soil. The bioremediation process was also monitored using various parameters, including pH, electrical conductivity, and the concentration of heavy metals. The results indicated that the consortium was able to reduce the concentration of lead by 80%, cadmium by 70%, and chromium by 60% in the soil.

Keywords: Bioremediation, Heavy metals, Soil contamination, Indigenous microorganisms, Lead, Cadmium, Chromium.

Introduction: Heavy metal contamination of soil is a major environmental problem. Heavy metals are toxic and persistent in the environment, and they can cause serious health and environmental problems. The bioremediation of heavy metal-contaminated soil is a promising approach for the removal of heavy metals from the environment. Bioremediation is the use of microorganisms to break down or transform pollutants into less toxic or non-toxic substances. The bioremediation of heavy metal-contaminated soil is a complex process that involves the interaction of various factors, including the type of microorganism, the concentration of heavy metals, the pH of the soil, and the electrical conductivity of the soil. The bioremediation of heavy metal-contaminated soil is a promising approach for the removal of heavy metals from the environment. Bioremediation is the use of microorganisms to break down or transform pollutants into less toxic or non-toxic substances. The bioremediation of heavy metal-contaminated soil is a complex process that involves the interaction of various factors, including the type of microorganism, the concentration of heavy metals, the pH of the soil, and the electrical conductivity of the soil.

Materials and Methods: The study was conducted in a laboratory setting. The soil used in the study was collected from a contaminated site. The soil was divided into two groups: a control group and a bioremediation group. The control group was kept in a sterile environment, and the bioremediation group was inoculated with a consortium of indigenous microorganisms. The concentration of heavy metals (lead, cadmium, and chromium) in the soil was measured at various time intervals (0, 7, 14, 21, and 30 days). The pH and electrical conductivity of the soil were also measured at various time intervals. The results were analyzed using statistical software.

Results: The results showed that the concentration of heavy metals (lead, cadmium, and chromium) in the soil decreased significantly over time in the bioremediation group compared to the control group. The concentration of lead in the soil decreased by 80% after 30 days of bioremediation. The concentration of cadmium in the soil decreased by 70% after 30 days of bioremediation. The concentration of chromium in the soil decreased by 60% after 30 days of bioremediation. The pH and electrical conductivity of the soil also decreased significantly over time in the bioremediation group compared to the control group.

Conclusion: The study demonstrated that a consortium of indigenous microorganisms is effective in the bioremediation of heavy metal-contaminated soil. The bioremediation process significantly reduced the concentration of heavy metals (lead, cadmium, and chromium) in the soil over a period of 30 days. The bioremediation process also resulted in a decrease in the pH and electrical conductivity of the soil. The results of this study suggest that bioremediation is a promising approach for the removal of heavy metals from the environment.

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