

172. Utilizing marine bacterial exopolysaccharides for efficient heavy metal removal in aqueous systems: An eco-friendly approach

Koosanjan F.¹, Mashreghi M.¹, Goharshadi F.K.² 1- Department of Biology, Faculty of Science, Ferdowsi University of Mashhad, Mashhad, Iran. 2- Department of Chemistry, Faculty of Science, Ferdowsi University of Mashhad, Mashhad, Iran mashreghi@um.ac.ir

The application of biosorbents as an eco-friendly strategy to address heavy metal accumulation in aqueous systems is of significant interest. This study investigates the efficacy of exopolysaccharide (EPS) derived from the marine bacterial strain *Vibrio alginolyticus* ATCC 17749 as a biosorbent for removing heavy metals. The research evaluates the sorption efficiency of cadmium (Cd) and nickel (Ni) by EPS, focusing on the effects of pH levels (3.5, 5.5, and 6.5) and biosorbent concentrations (65-300 mg/L) on the maximum sorption time. Field Emission Scanning Electron Microscopy (FESEM) analysis revealed a disruptive effect on EPS after Cd sorption, attributed to the bonding mechanism. Atomic absorption spectroscopy measured cation concentrations post-sorption, showing over 80% removal efficiency for Cd and 50% for Ni. The sorption mechanism involves functional groups on the surface of bioadsorbent, facilitating the formation of EPS-heavy metal complexes and metal deposition. These findings highlight the potential of utilizing EPS of *Vibrio* species as an effective biosorbent for heavy metal removal, offering a sustainable approach to water bioremediation.

173. Investigating the effect of reducing oral *Streptococcus mutans* population by the first Iranian herbal toothpaste containing *Salvadora persica* extract, honey and some herbal essential oils compared to a chemical toothpaste

Mansour Y.¹, Zanganeh S.², Arzhang P.¹, Motevalia S.M.A.³ 1- R&D department of Armaghan Behdasht Amin Faraz, Hamedan, Iran. 2- Science and Technology Park, Hamadan, Iran. 3- Qom Faculty of Dentistry, Qom, Iran CA: zanghsadeghl@gmail.com

Streptococcus mutans is one of the biggest cause of dental plaque. Some of the factors that reduce dental plaque is the extract of the *Salvadora persica* and honey. In this study, the effect of two types of Iranian toothpaste, one completely herbal and the second completely chemical, was investigated. This research was conducted on 70 patients of Qom Faculty of Dentistry, in two groups of 35 people. Sampling was done in 4 steps. Stage 1, before use. Stage 2, two weeks after daily use, stage 3 was three months and the fourth one was six months after of the starting the test were performed on the saliva of people by sterilized swab. All the saliva samples were cultured on the Blood Agar then in the modified specialized Mitis salivarius-bacitracin 10% Agar, *S.mutans* by other microbial method was determined. The number of colonies was checked during four stages. The first stage, microbial counts of both groups were the same, the second stage, 45% reduction compared to the initial state in both groups, in the third stage, 62% reduction in the colonies by herbal toothpaste and 48% reduction by chemical toothpaste compared to the initial state was observed. In the last stage, the amount of bacteria reduction with herbal toothpaste was 71% and by chemical toothpaste was still 48% after six months. According to the results, the presence of *S. persica* extract, honey, as well as plant essential oils containing carvacrol, cinnamaldehyde, eucalyptol and menthol in the herbal toothpaste sample has made it more effective than the chemical one.

174. Investigating ultrasonic method to disrupt yeast cell wall

Mirbagheri S.P., Darvishi F. Department of Microbiology, Faculty of Biological Science, Alzahra University, Tehran, Iran CA: f.darvishi@alzahra.ac.ir

Yeast extract contains the soluble components inside yeast cells, which is obtained by removing the cell wall, extracting and concentrating the cell contents soluble in water. To obtain yeast