عنوان مقاله:

Research Article: Characterization of the aluminum-resistant microalgae by screening industrial wastewater microorganisms

محل انتشار:

مجله علوم شیلات ایران, دوره 22, شماره 1 (سال: 1401)

تعداد صفحات اصل مقاله: 18

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خلاصه مقاله:

Aluminum (Al) is a major concern in acidic environments as it can lead to the accumulation of reactive oxygen species (ROS), which induce oxidative stress in the host. Assessment of Al-resistant microorganisms can help scientists to discover their mechanisms and improve bioremediation techniques. The present study aimed to characterize Al-resistant microalgae by screening industrial wastewater microorganisms. The microalgae were treated with ۰, ۱۰, and ۱۰۰ µM Al. Then, H۲O۲, malondialdehyde (MDA), catalase (CAT), and peroxidase (POX) values were measured. In addition, the effects of time (۳۰-۳۰۰ min), Al concentration (۰-۳۷۰ µM), and pH (۴.۰-۶.۵) on Al removal were investigated using the design-expert software. The efficiency of various biosorbents in Al removal was also evaluated in the optimal conditions of the final experiment. According to the results, Scenedesmus sp. was the most resistant microalgae and produced more biomass at ۱۰۰ µM. Moreover, the POX and CAT activities of Scenedesmus sp. were increased by the high Al concentrations. In optimum conditions (۸۱.۶۰ µM Al, pH ۵.۸, ۴۵ minutes), free cells (without modifications) were effective in Al biosorption (۹۳.۵۶%).

کلمات کلیدی:

Aluminum, Antioxidant, Bioremediation, Scenedesmus, Oxidative stress