

عنوان مقاله:

Comparison of Fe and Zn Bioavailability among Three Methods DTPA-TEA, EDTA and a Simple Method in Haloalkaliphilic Strains

محل انتشار:

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خلاصه مقاله:

In order to compare the bioavailability of iron (Fe) and zinc (Zn) in haloalkaliphilic bacteria isolated from saline and alkaline soil resources in Khorasan Razavi Province (Iran) and study these nutrients' bioavailability for plants under soil salinity stress, the three extraction methods including DTPA-TEA, EDTA and a simple one was used. The collected haloalkaliphilic bacterial strains were isolated and purified with a specific haloalkaliphilic bacteria medium. Afterwards, Fe and Zn concentrations were measured by atomic absorption spectroscopy using three replicates and three different extraction methods. The results showed that the concentration of Fe and Zn in the three methods differed significantly ($P \leq 0.05$). The highest concentration of available Fe in the haloalkaliphilic strains was observed in DTPA-TEA, followed by simple and EDTA methods. Unlike Fe, Zn concentration was maximum in the simple and EDTA methods, but the concentrations of Zn in these two methods showed no significant difference from each other. Being minimum in the DTPA-TEA method, Zn concentration of the haloalkaliphilic strains showed a significant difference in comparison with the other two methods. Only five haloalkaliphilic strains: HA8, HA9, HA7, HA10 and HA11 had Fe among all the other strains. Fe concentrations in both HA8 and HA9 were maximum without significant difference to each other. The results of experiment on Zn concentration also showed that all fifteen isolated strains had Zn. Maximum Zn observation was recorded in HA5, HA4 and HA1 with significant differences compared with the control. The study on interaction effects between strains and the method of measuring Fe concentration also showed that the strains: HA7, HA9, HA8, HA10, HA11 and HA6 in DTPA-TEA method had the maximum concentration and except HA6 the others had significant differences to the control. Minimum Fe concentration was observed in HA9 and HA11 in EDTA method without a significant difference among these assays. Maximum Zn concentration was observed in HA5×EDTA and then in HA4×simple method with a significant difference to each other and to the control. Then maximum Zn concentration was observed in HA10× EDTA, HA1× simple method, HA3 × simple method, HA11× simple method, HA1× EDTA and HA8× simple method without significant differences among them but with significant difference compared to the control. Finally, results of the experiment indicate that DTPA and simple methods are more efficient for Fe and Zn measurement respectively. Because of measuring these micro nutrients based on these ... ,methods

کلمات کلیدی:

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