**Study on related bacteria to saffron rhizosphere in Gol-e ferez, Birjand county, Iran**

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Abstract

Rhizosphere is a thin layers (usually from one millimeter to several centimeters) of soil around the roots that living organisms community in that zone are quantitatively and qualitatively under the influence of root vital activities such as respiration, nutrition and root exudates. Various groups of microorganisms are found in this area that might be useful for the host plants. This research aimed to identify the bacterial species existing around the saffron roots and to study the probable effects of these bacteria on the saffron growth. the experiments were performed in Pathology laboratory and plant nursery in Collage of Agriculture at University of Birjand in 2013-2014 using soil samples taken from saffron fields at Gol village in Birjand region. Sampling was performed both during and after plant growth period. The soil around the roots along with some saffron roots from the fields with different planting ages, 4-5 samples from each farm, were taken and mixed with each other and transferred to the laboratory for soil bacteria isolation. In this study, a total of 63 bacterial strains were isolated and purified using specific mediums. Finally, 20 strains were selected from all strains. Identification was performed using microscopic and biochemical tests and ITS (Internal transcribed spacer) sequencing zone. Based on the ITS sequence zone, most strains were Bacillus species that were confirmed by biochemical and morphological tests. Saffron corms inoculated with 18 identified strains and 3 commercial bacteria (Ps, Azt and Azo) and the control (non-inoculated) were planted as a completely randomized design with three replications in the nursery of and at the end of the growing season, plant growth characteristics (leaf area, daughter corms number and weight) were measured.. Analysis of variance showed that inoculation to saffron soil had no effect on leaf dry weight but leaf area, daughter corms size and numbers were affected significantly (p< 0.01). Based on the results of this study and also based on further researches, these bacteria could be recommended to increase growth characteristics in saffron fields.

Keywords: Root exudates, Microorganisms, Isolation, Auxin