

Abstract

Millet is a micro-nutrient and small-seed plant. A total of 143 and 134 seeds of proso millet and foxtail millet genotypes corresponding to a wide range of proso millet and foxtail millet germplasms were procured by Iranian center of excellence for drought and salinity tolerant crops in Research and Technology Institute of Plant Production (RTIPP) belonged to Shahid Bahonar University of Kerman-Iran. The research was conducted in two locations at RTIPP (Shahid-Bahonar University of Kerman and Ekhtiyarabad fields). The experimental design was performed in a randomized complete block design with 3 replications under two conditions (normal and salinity) over a two year- long period (2017-2018). Fifteen agronomic traits were measured in Proso millet and fourteen important traits for foxtail millet including grain yield, forage yield, and biological yield were measured and then the obtained data were analyzed statistically. Then AFLP markers were used to prepare the association analysis. Of the total 20 primer combinations used in this investigation, 12 primer combinations with the highest polymorphic bands were selected in foxtail millet and 11 primer combinations in proso millet were selected. The population structure was determined based on was determined structure analysis. According to the association analysis performed by the MLM model, the number of markers showing the significant relationship with the average of the investigated traits was determined 67 and 65 under normal and salinity stress conditions, respectively. Moreover, the number of considerable markers increased to 93 and 99 under normal and salinity stress conditions, respectively.

The association analysis of average traits using the GLM model (P+Q matrices) in foxtail millet indicated that 114 and 107 markers were significant ($P < 0.01$) under normal and salinity-stress conditions, respectively. According to the association analysis performed by the MLM model, the number of markers showing the significant relationship with the average of the investigated traits was determined 93 and 99 under normal and salinity stress conditions, respectively. The markers used in this investigation had strong effects with highly significant P-value. Therefore, the introduced markers which had significant associations with important agronomic traits could be suitable candidates for further study in order to marker-assisted breeding to improve salinity-resistance genotypes of foxtail millet in arid and semiarid areas.

Keywords: Proso millet, Foxtail millet, Analyzed statistically, Drought stress, AFLP marker.



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**Association mapping of salinity tolerance traits in some of
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