

عنوان مقاله:

Mapping QTL with additive effects and additive x additive epistatic interactions for plant architecture in wheat (*Triticum aestivum* L)

محل انتشار:

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نویسندگان:

حمزه حمزه - *Sugar Beet Research Department, Agricultural and Natural Resources Research Center of Hamedan, Agricultural Research, Education and Extension Organization (AREEO), Hamedan, Iran*

علی اصغری - *College of Agriculture Researcher, University of Mohaghegh Ardabil, P. O. Box: ۵۶۱۹۹-۱۱۳۶۷, Ardabil, Iran*

سید ابوالقاسم محمدی - *Department of Plant Breeding and Biotechnology, Faculty of Agriculture, Univeristy of Tabriz, Tabriz, Iran*

امید سفالیان - *College of Agriculture Researcher, University of Mohaghegh Ardabil, P. O. Box: ۵۶۱۹۹-۱۱۳۶۷, Ardabil, Iran*

سلیمان محمدی - *Department of Seed and Plant Improvement Research, West Azerbaijan Agricultural and Natural Resources Research Center, AREEO, Urmia, Iran*

مجتبی نور آیین - *Department of Agronomy and Plant Breeding, Faculty of Agriculture University of Maragheh, Maragheh, Iran*

خلاصه مقاله:

In bread wheat (*Triticum aestivum* L.), crop height is an important determinant of agronomic performance. To map QTLs with additive effects and additive×additive epistatic interactions, 148 recombinant inbred lines and their parents, ('YecoraRojo' and Iranian landrace (No. #49)) were evaluated under normal and water deficit conditions. The experiments were carried out on research farms of Mahabad University and Miyandoab Agricultural Research Center in 2014-2015. The experimental design was an alpha lattice design with two replications. Quantitative trait loci (QTL) for the studied traits were carried out for additive effects and additive×additive epistatic interactions using the QTL Network 2.0 software based on the mixed-linear model. A number of 177 microsatellite and 51 retrotransposon markers were used to construct the linkage map. In the present study stem length, plant weight, peduncle length, and peduncle weight were measured. Results showed that under both normal and water deficit conditions, both positive and negative transgressive segregations were significant, also the highest and lowest broad and narrow sense heritability were estimated for stem length (73.69 and 36.74 percent) and peduncle length (40.51 and 20.25 percent), respectively. The results showed that under the normal condition, seven QTLs ($R^2A=5$ to 11%), and eight additive×additive epistatic interactions ($R^2AA=1.66$ to 10.92%) were significant. Under the water deficit condition seven QTLs ($R^2A=4.27$ to 9%), and five additive×additive epistatic interactions ($R^2AA=3.8$ to 14.58%) were significant. Five QTLs from the 14 QTLs identified in this study were located in chromosome 5A, indicating the importance of this chromosome in controlling the plant architecture characteristics and possibly using it for marker-assisted selection and genetic engineering.

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