

Investigation and selection among native populations of Flixweed (*Descurainia sophia*) of Khorasan Razavi province for yield and yield components under greenhouse condition

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Extended Abstract

Habibi, N., Nemati, S. H., Azizi Arani, M., Aroiee, H. Investigation and selection among native populations of Flixweed (*Descurainia sophia*) of Khorasan Razavi province for yield and yield components under greenhouse condition

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Introduction: Nowadays, many pharmaceutical industries devote a particular attention to the chemical composition of plants, which has led to the establishment of extensive experimental and production fields for medicinal plants as an important branch of agriculture. In this regard, hundreds of hectares of agricultural land are annually allocated to the cultivation of medicinal plants. Due to the fact that Flixweed (*Descurainia sophia*) is one of the medicinal plants used in traditional medicine (Omidbeigi, 2009), this study was conducted to select among native populations of Khorasan Razavi province based on quantitative, qualitative and pharmacological traits.

Materials and Methods: In this study, 10 populations of Flixweed plants including Davarzan, Almagaq, Bashroyeh, Sarband-Kalat, Golmakan, Fariman, Kashmar, Raobat-Sang, Ghalezo and Bakhezh were used. After collecting different populations, the experiment was conducted at the research greenhouse of faculty of agriculture of Ferdowsi university in a factorial arrangement during the period from September 2015 to December 2017. The first factor consisted of 10 populations and the second factor included 6 generations (each generation was in a pot for about 4 consecutive months, therefore, the experiment lasted about 2 years). SPSS 19 software was used to analyze the data. To compare the means, the

least significant difference was used.

Results and Discussion: The results showed that with increase of generation number from one to six, the weight of a thousand seeds increased continuously. There was a significant statistical difference between the Golmakan population, which had the highest 1000-seed weight, and the Almajaq population, which had the second highest 1000-seed weight. According to the results obtained in the first generation, the highest similarity was observed in Davarzan, Robat-Sang and Fariman populations in terms of low and poor performance of the functional traits. Also, in the first generation, the highest similarity was observed in Golmakan, Sarband-Kalat and Ghalezo populations in terms of high values of functional traits. According to the results obtained in the 6th generation, the highest similarity was observed in the populations of Bashrooye, Davarzan and the Robat- Sang in terms of low and poor performance of the functional traits. Also, in the 6th generation, the highest similarity was observed in Golmakan, Sarband-Kalat, Ghalezo populations in terms of high values of germination traits. This suggests that the populations Golmakan, Sarband-Kalat, Ghalezo have a high potential for enhancing functional traits in breeding programs. According to the results obtained in the first generation, the highest similarity was observed in the populations of Alamagh, Kashmar and Davarzan in terms of low and poor quality of traits. Also, in the first generation, the highest similarity was observed in the populations of Bakhzar, Ghalezo and Golmakan for high-quality traits. According to the results obtained in the 6th generation, the highest similarity was observed in the populations Sarband-Kalat and Robat-Sang for low- and poor-quality traits. Also, in the 6th generation, the highest similarity was observed in Fariman, Davarzan and Golmakan populations for high values of germination traits. Humphreys (1991) reported that increasing the genetic distance between the genotypes of a species raises the possibility of heterosis in breeding. Grouping genotypes based on the genetic distance is effective in a breeding program when several traits are simultaneously examined. Population grouping in this research was well illustrated based on distinctive traits in cluster analysis, so that the populations whose performance was higher than average were more productive. For a cluster and populations with a higher average agronomic performance, a separate cluster was formed, which can be considered as superior populations in terms of yield (Belnap & Sherrod, 2008).

Conclusion: The results of this study suggested that the populations Freeman, Davarzan and Golmakan exhibited a high potential for inclusion in breeding programs with the prospect of increasing qualitative traits, which is very important in terms of raising the quality of seeds.

Keywords: Flixweed, medicinal plants, *Descurainia sophia*, pharmacological traits.

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