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Department of Horticulture and Landscape

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Morphological and molecular variation of fennel

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Abstract

To assess the genetic diversity and morphological fennel and select the best genotype, 10 varieties of fennel seeds collected from different areas in Iran in an experiment with a randomized complete block design with three replications were studied and compared at the Research Farm of Zabol University, Sistan Dam during the year 1391. Cultivars included, fennel Mashhad, Isfahan, Hamadan, Shiraz, Kerman, Yazd, Arak, Skinheads, was Nehbandan and malayer. traits of study of economic performance, harvest index, dry performance, chlorophyll, leaf length, Umbels per plant, number of seeds per umbel, stem length, stem diameter, percent ash, percent oil, phosphorus, potassium, sodium, thousand grain weight, carbohydrates and proline, respectively. The secondary metabolite are measured by gas chromatography. The genetic diversity of the samples was done by the two markers ISJ and ISSR. The statistical analysis for phenotypic analysis included analysis of variance, mean comparison, the correlation phenotypic between traits and principal components analysis was performed using SAS softwarea nd for genetic data analysis was used Genalex software. Cluster analysis and phenotypic and genetic Dendrogram draw was conducted using NTSYS software. Analysis of variance on the effect of genotype is highly significant for all traits. Among the studied cultivars, Shiraz cultivar showed the highest number of umbels, number of seeds per umbel, seed weight, economic performance, Harvest index, ash percentage, essential oil content and proline. The principal components analysis, the first three components explained a total of 91% of variety that Only 64% of the variation explained by the first component. The main components are the secondary metabolite,9 components were higher than one that the first three components explained 59% of the total variation. By Cluster using cluster analysis were identified three groups. The results molecular also were indicating a superiority marker issr to marke isj for detection of genetic diversity. Also among the 24 primers used in markers issr, primer 8 and primer 6 isj marker showed the superiority to detect genetic variation of fennel than other primers.

Key words: Fennel, Genetic diversity, ISSR marker, ISJ marker