Evaluation of the Relationship between Freezing Tolerance, Storage Protein Markers and Some Physiological Traits in Barley (*Hordeum vulgare* L.)

Maryam Behi[1], Omid Sofalian[2]*, Majid Shokrpour[3], Ali Asghari[4], Saeed Khomari[1] and Behnam Firoozi[1]

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Abstract

In order to evaluation of the relationship among protein markers and traits such as proline content variation, quantum efficiency of photosystem II and field viability index, 20 genotypes of barely were studied in a randomized complete block design in the greenhouse experiment. Plants were transferred to springhouse at the four leaf stage and were located at the temperature of 4°C for three weeks. The leaves were sampled, before and after the adaptation phase, to measure proline amount quantum efficiency of photosystem II (Fv/Fm). Then freezing treatments were applied by temperatures of -4, -7, -10, -13 and -16. Also, these genotypes were planted in the field to determine the parameters of LT_{50} and FSI. According to our findings, some significant relations between protein markers and freezing resistance in *hordeum vulgar* was determined. According to A-PAGE technique, the obtained results showed decreasing trends in quantum efficiency of photosystem II, respectively, during adaptation phase. It was found significantly negative correlations between FSI and LT_{50} (-0.601). Cluster analysis classified by FSI, LT_{50}, proline, Fv/Fm, the genotypes of F-A1-1, F-A1-2, F-A2-11 and F-GRB-85-5 and cultivars of Sahra, Sahand, Dasht and Makooii were located in group that had a high value of FSI and LT_{50}. In this recearch, Makooii knowened as the most resistant veriety because of LT_{50}= -17.66 and high FSI value. Based on regression analysis, there are relationship among four markers and $LT_{50.}$ Our results showed that we can introduce these markers as selection of the resistant lines.

Keywords: A-PAGE, FSI, LT_{50}, proline, regression analysis.

1. Post Graduate Student, Department of Agronomy and Plant Breeding. Faculty of Agricultural Science, University of Mohaghegh Ardabili, Ardabil, Iran
2. Assistant Professor, Department of Agronomy and plant Breeding, Faculty of Agricultural Science, University of Mohaghegh Ardabili, Ardabil, Iran **(Corresponding Author:** sofalian@gmail.com**)**
3. Assistant Professor, Department of horticulture, Agriculture and natural resource campus, University of Tehran, Karaj, Iran
4. Associated Professor, Department of Agronomy and plant Breeding, Faculty of Agricultural Science, University of Mohaghegh Ardabili, Ardabil, Iran

Effective Traits on Grain Yield of Wheat Genotypes under Optimal Irrigation and Drought Stress during Reproductive Phase

Ahmad Jafarnezhad[1*], Hossein Aghaie[2] and Godarz Najafian[3]

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Abstract

In order to determine traits which affected grain yield in optimal irrigation and terminal drought deficit conditions, a field experiments with 16 spring bread wheat genotypes as randomized complete block design with three replications conducted in Neishabour during 2009-10 cropping seasons. Results of combined analysis of variance showed, significant differences between many of traits vegetative stage included: specific weight and flag leaf area, rate and grain filling period and also yield components such, no. spike/m^2, grain/spike and 1000 grain weight. Grain yield in optimal and water stress were 7335 and 5493 kg/ha, respectively. Mean of decreased grain yield of genotypes in water stress conditions was 25 percent, with range between 10-51 percent. Hence some of genotypes have desirable and stable yield in two conditions. Superior genotypes in drought condition have heavier grain and faster grain filling rate, and in optimal condition, they have more grain/spike, longer grain filling period, spike/m^2 and larger flag leaf area. So traits that affected yield in two conditions were different. In general genotypes *DN-11* and *KAUZ/PASTOR* in two conditions have acceptable grain yield.

Keywords: flag leaf, grain filling period, limit irrigation, relative water content.

1. Assistant Professor, Agriculture and Natural Resources Research Station of Neishabour, Neishabour, Iran **(Corresponding Author:** ajafarnzhad@yahoo.com**)**
2. Research Expert, Agriculture and Natural Resources Research Station of Neishabour, Neishabour, Iran
3. Associate Professor, Seed and Plant Improvement Institute, Karaj, Iran

Assessment of Genetic Diversity among Some Male and Female Pistachio (*Pistacia vera* L.) Genotypes using RAPD Marker

Mahboubeh Hajizadeh Hosseinabadi[1], Hamidreza Karimi[2]*, Hossein Dashti[3], Mohammad-Hossein Shamshiri[4] and Ali Tajabadipour[5]

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Abstract

In order to study the genetic diversity among some male pistachio genotypes, 16 male pistachio genotypes and 8 female pistachio cultivars were selected from Iranian Pistachio Research Institute (IPRI). 12 RAPD primers were used which totally produced 65 bands that among them 48 bands were polymorphic and 17 bands were monomorphic. Cluster analysis based on similarity matrix and Jaccard similarity coefficient and UPGMA method, at distance of 0.49 similarity, pistachio genotypes were situated into 5 main group. Study genetic diversity among male genotypes of pistachio using RAPD markers identified their genetic status so that divided female genotypes as well as male genotypes and MO_{12} male genotype seems to be due to a number of less genetic similarity with female genotype can be used as an suitable pollinator for this cultivars which research is needed in this context through controlled pollination occurs. According to the results of this research male pistachio genotypes had high diversity due to non-grafting male genotypes in pistachio orchard, which make vast diversity in male genotypes in comparison with female cultivars.

Keywords: cluster analysis, pistachio (*Pistacia vera* L.), RAPD primer.

1. MSc., Horticulture, Department of Horticultural Science, Faculty of Agriculture, Vali-e-Asr University of Rafsanjan, Rafsanjan, Iran
2. Associate Professor, Department of Horticultural Science, Faculty of Agriculture, Vali-e-Asr University of Rafsanjan, Rafsanjan, Iran **(Corresponding Author:** h_karimi1019@yahoo.com**)**
3. Associate Professor, Department of Agronomy and Plant breeding, Faculty of Agriculture, Vali-e-Asr University of Rafsanjan, Rafsanjan, Iran
4. Assistant Professor, Department of Horticultural Science, Faculty of Agriculture, Vali-e-Asr University of Rafsanjan, Rafsanjan, Iran
5. Instructor, Department Plant Biotechnology and Breeding, Pistachio Research Institute of Iran, Rafsanjan, Iran

Evaluation of Agronomic and Seed Qualitative Traits of Superior Winter Rapeseed (*Brassica napus* L.) Varieties

Marefat Mostafavi-Rad[1], Majid Azad Marzabadi[2] and Sakineh Faraji[2]

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Abstract

In order to compare yield and agronomic characteristics of 38 new winter rapeseed (*Brassica napus* L.) cultivars along with Okapi as check, a field experiment was carried out based on randomized complete block design during 2009-10 cropping season with three. Rapeseed cultivars showed significant differences for all traits at 1 percent probability level. In this research, ES Betty, NK Karibik, NK Aviator, Champlain and RNX 3621 cultivars showed the highest grain yield. In order to evaluate qualitative characteristics of superior rapeseed (*Brassica napus* L.) varieties, another field experiment was performed in 2010-11 cropping season. Five superior rapeseed varieties, selected of first experiment along with Okapi, Modena and Licord as check comprised the experimental factors. Results showed that ES Betty variety had the highest seed yield and linoleic acid. NK Aviator and Champlain varieties showed superiority for linoleic acid. ES Betty and NK Aviator had the lowest oleic acid. Also, Modena and Champlain varieties showed the highest seed content of both Iron (Fe) and Zinc (Zn). Licord had the greatest seed content of Copper (Cu) and Manganese (Mn). There was positive and significant correlation between seed yield, linoleic acid and glucosinolate content. Rapeseed cultivars had significant differences for seed yield, glucosinolate content, fatty acids combination and seed content of micro nutrients elements. Also, there was inverse relationship between quantitative and qualitative yield in rapeseed.

Keywords: fatty acids, glucosinolate, rapeseed, seed micro nutrient elements, yield.

1. Assistant Professor, Agricultural and Natural Resources Research Center of Guilan Province, Rasht, Iran (**Corresponding Author:** mmostafavirad@gmail.com**)**
2. Expert, Agricultural and Natural Resources Research Center of Markazi Province, Arak, Iran

Assessment of Relationships of Quantitative and Fiber Quality Traits and their Variations among Tetraploid Cotton (*G. hirsutum*) Cultivars

Mousareza Vafaie-Tabar[1]

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Abstract

In order to correlation diversity assessment among the quantitative and fiber quality traits, five cultivars of tetraploid cotton (*G. hirsutum*) cultivars were evaluated at Varamin region in 2009. In this study the populations of the cultivar lines were planted near together and 100 lines randomly were selected at the end of the season followed by measuring seed cotton yield and quantitative and fiber quality traits of each plant. The correlations among the traits, stepwise regression analysis of lint percent as dependent variable and other traits as independent variables calculated for cultivars, separately, as well as all them together. Further, cluster analysis using Ward method was used to classify the cultivars in view of all traits and correlations. The results showed that, there is a high variation among cultivars regarding correlation among the traits. The correlation between fiber length and fiber fineness was negative among all cultivars and only it was significant with Sealand and Avangard cultivars. There was not any significant correlation between seed cotton yield and fiber quality traits among cultivars. The variation also existed among cultivars in term of the traits which entered the multiple regression models and affected the fiber percent. Cultivars classification based on correlation among the traits was in agreement with that based on measured traits. The results suggest that the existing variation among cultivars may be useful for further cotton improvement programs.

Keywords: cluster analysis, correlation of traits, *Gossypium*, regression.

1. Assistant Professor, Department of Cotton and Fiber Plants Research, Agriculture and Natural Resource Research Center of Tehran, Varamin, Iran (E-mail: mvafaiet@yahoo.com)

Cyto-Geneticy Evaluation of Back-Crossed Genotypes Derived from Iranian Endemic Cottons with *Arboreum* Species

Zahra Harati[1] and Mousareza Vafaie-Tabar[2]

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Abstract

This study was carried out in order to investigate on chromosomal behavior during meiosis in *herbaceum* (Iranian endemic), *arboretum* species, F1 hybrids of two species and BC_4 genotypes. The endemic varieties used in this study were Semnan and Shahreza (*herbaceum*) and VTDL as *arboretum* cultivar. F1s investigations showed that in the adjacent and alternative quadrivalents frequently but the BC_4 offspring population the quadrivalents were appeared in low frequency. Besides, other abnormalities like univalent, trivalents and triple sets of chromosomes in MII and AII were observed which was resulted in the deviation from Tetrads. Repeated back-crosses caused to reduce the irregularities, as most of the plants showed normal behavior of meiosis. Since simultaneously breeding for all traits, especially through far hybridization, are not possible at one stage, so the resulted offspring would be great achievement at the early steps of endemic cotton improvement.

Keywords: cotton, *Herbaceum,* meiosi, *quaddrivalent.*

1. MSc. Student, Department of Agronomy and Plant Breeding, Faculty of Agriculture, Islamic Azad University, Science and Research Unit, Tehran, Iran

2. Assistant Professor, Department of Cotton and Fiber Plants Research, Agriculture and Natural Resource Research Center of Tehran, Varamin, Iran (**Corresponding Author:** mvafaiet@yahoo.com)