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Sequential Path Analysis Based on Yield and Morpho-Physiological Characteristics in Squash Landraces from Northwest of Iran

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Abstract

Background and Objectives
Squash is an annual herbaceous plant and grows in tropical and subtropical regions of Europe and America .Edible species are divided into three groups of zucchini or courgette, gourd and pumpkin squash. The seed of pumpkin squash has high nutritional value due to its high protein and oil content. Iran is ranked fourth in terms of production and cultivation area of squash in the world after China, India and Russia. The present study was conducted in order to determine the most important morphological and physiological characteristics influencing yield in squash landraces from Northwest of Iran.

Materials and Methods
Eighteen squash landraces comprising 11 confectionery landraces, 5 gourd landraces and 2 ornamental landraces were evaluated in a randomized complete block design with three replications in Saatlou research station of West Azerbaijan .The landraces were evaluated for morphological and physiological characteristics based on International Board for Plant Genetic Resources (IBPGR)) descriptor.

Results
The results of phenotypic correlations revealed that the characteristics including number of fruit, fruit weight, 100 seed weight, fruit diameter, seed thickness, plant height, internodes length, primary branch and fruit pH and characteristics including seed weight, peduncle lengths, sepal's length of female flower and fruit total soluble solids have positive and significant correlations with fruit yield at 1 and 5 percent probability level, respectively. In stepwise regression, four features including internodes length, sepal's length of female flower, chlorophyll percentage and fruit pH were entered in model. The results showed that fruit pH and internodes length have the most direct and positive effect on the fruit yield, and the percentage of chlorophyll has the highest indirect effect through internodes length on the fruit yield.

Discussion
Sequential path analysis showed that selection of genotypes based on only correlation coefficient

may not be effective. Several characteristics were identified to explain squash yield during path analysis. Selection based on identified characters would be more effective in improving yield in squash breeding programs.

Keywords: Path Analysis, Squash landraces, Stepwise regression, Yield