The effect of salt stress on morphological characteristics and Na^+, K^+ and Ca^+ ion contents in medicinal plant fenugreek (*Trigonella foenum graecum* L.) under hydroponic culture

A. Archangi*, M. Khodambashi and A. Mohammadkhani[1]

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Abstract

Considering the increasing trend of saline land enhancement and lack of appropriate agricultural lands, identifying salt resistant plants such as fenugreek, which is an important medicinal plant, is important. To do so, a factorial experiment was conducted in the form of randomized complete blocks design with three replications on three fenugreek landraces (Yazd, Shiraz and Hendi) and five salinity levels (0, 40, 80, 120 and 160 mM NaCl) in hydroponic culture in greenhouse of College of Agriculture, Shahrekord University. The results showed that plant height, root length, shoot dry weight, root dry weight, and number of leaves per plant was reduced with the increase of salinity level. Increasing salinity level led to an increase in the amount of Na^+ in shoot dry matter, while the amount of Ca^{+2} and K^+ and Ca^{+2}/Na^+ and K^+/Na^+ ratios were decreased. The Yazd cultivar had the highest mean plant height (20.1 cm), shoot dry weight (1.94 g per plant) and number of leaves (13.4 per plant). Whereas, Shiraz cultivar had the highest amount of Ca^{+2} and K^+ ions and also Ca^{+2}/Na^+ and K^+/Na^+ ratios. Based on the results of this research, it seems that Shiraz landrace, carrying genes related to salinity tolerance could be used to improve high yielding genotypes.

Keywords: Salinity resistance, Ion accumulation, K^+/Na^+, Ca^{+2}/Na^+.

1. Dept. of Agron. and Plant Breed., College of Agric., Shahrekord Univ., Shahrekord, Iran.
*: Corresponding Author, Email: azin_archangi84@yahoo.com

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