

Abstract

Purslane (*Portolaca oleraceae* L.) known as a weed, but due to the valuable medicinal properties and its use in food, oily and fodder is introduced as one of the most widely used medicinal plants by World Health Organization in order. To study the effects of different irrigation regimes and fertilizers on quantitative and qualitative characteristics of purslane, an experiment with split plot in randomized complete block design with three replications was carried out in agricultural research institute of Zabol University in 2015. The main plot consists of three main irrigation regimes of irrigating with 90% (no stress), 70% (moderate stress) and 50% (severe stress) available soil moisture. The fertilizer treatments are the application of amino acid tryptophan (5 grams per liter), hormone 24-Epibrassinolide (0/5 mg per liter), manure Nitroxin (*Azospirillum* and *Azotobacter*) (5 liters per hectare) and no fertilizer (control). Results showed that the effect of irrigation regimes, fertilizer and their interaction on plant height, stem diameter, root length, fresh and dry weight of leaves and root, number of capsules per plant, grain weight, shoot yield, chlorophyll a and b, proline, anthocyanins, carbohydrates, flavonoids, protein, catalase, ascorbate peroxidase and guaiacol peroxidase in the leaves, leaf and seed oil content was significant, but no significant effect on composition of fatty acids was observed. The maximum plant height, stem diameter, fresh and dry weight of leaves and roots, number of capsules per plant, grain weight, shoot yield, chlorophyll a and b, protein and oil content was seen in normal irrigation treatment (90% moisture). However, increase in drought stress intensity reduced the obtained characteristics magnitude. While the roots length, proline, anthocyanins, carbohydrates, flavonoids, catalase and guaiacol in leaves increased with drought stress escalation and the highest activity of APX was measured under the moderate stress treatment, increase of this features reduced the drought losses. comparison of the mean effects of the interaction of the fertilizer and drought factors showed that the application of Nitroxin increases the fresh and dry weight leaves of seed weight, shoot yield and oil content in the seed leaves in the normal irrigation and the amount of anthocyanins, carbohydrates and flavonoids increased under the severe drought stress. Application of the 24-epibrassinolide increased the plant height, stem diameter, fresh and dry weight of the root, of the number of capsules per plant, chlorophyll a and b and protein under the available water conditions, but in interaction with water shortage activity of the catalase, ascorbate peroxidase, guaiacol and proline content increased and thereby the plant increased resistance to drought stress. Tryptophan application under the drought stress condition acquired the maximum root length.

Key words: fatty acids, drought stress, bio-fertilizer, amino acid



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Application of Tryptophan, 24-Epibrassinolide and Nitroxin on qualitative and quantitative traits of purslane (*Portulaca oleraceae*), under drought stress

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