**Abstract**

In order to survey the effect of silver nano particles and weight of root on physiological and morphological features of Crocus Sativus under climatic conditions in the area of Systan, it was accomplished a test in factorial with randomized complete base-blocks design and 3 repeats on two different weights of Crocus Sativus root (including more and less than 8g) and two different concentrations of nano silver treatment (zero and 50ppm) in the village of Dadi located in Teymourabad district of Hamoun City during two consecutive years; 2014-2015 and 2016. Environmental factors included: minimum and maximum temperature each day and night, rate of moisture, and amount of rainfall wind speed. Also, they were measured the properties of soil consisted of: pH, EC, soil texture, sodium, potassium and calcium carbonate during two consecutive years. Evaluated features contained: height of leaf, diameter of leaf, number of leaf, length of pappus , fresh and dry weights of pappus, fresh and dry weight of flowers, weight of female roots, number of bud, number of female roots, Chlorophyll a, chlorophyll b, carotenoid and content of Crocin (main factor of color), Picrocrocin (main factor of bitter flavor), Safranal (main factor of perfume). The test results represented that most studied features such as: height of leaf, fresh and dry weight of flower, length of root, diameter and number of leaves, fresh and dry weights of pappus were influenced by nano silver solution in first year. The effect of root weight on morphological features demonstrated that features such as: height of leaf, length of pappus, fresh and dry weight of flower, the height of flower in last stage, length of root, diameter and number of leaf, number of bud, fresh and dry weight of pappus were influenced by the weight of root. In second year as in the first year, all studied features were observed in nano silver treatment that the features were influenced by nano silver solution and the roots which had been smeared with nano solutions, had significant increase than witness group. In the year, the effect of the root weight on tested features followed the pattern of the first year and all features showed a sensible increase in roots less than 8g rather than larger roots. The results from analyzing the quantitative features and color of Crocus Sativus in HPLC method represented that pigment and flavor of Crocus Sativus has had a significant increase in the sample smeared with nano silver solution, it was also observed that pigment and flavor of Crocus Sativus had a significant increase in the sample which has been smeared with nano solution.

**Keywords**: Crocin, Crostein, Picrocrocin, Safranal, root

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# Effect of silver nanoparticles and corm weight on physiological and morphological traits of saffron (*Crocus Sativus*) under Sistan climatic conditions

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