

Title Effects of ozone treatment on microflora of dried saffron and its living larvae
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Abstract

Saffron is an expensive agricultural and pharmaceutical that has a special position among industrial and commercial products. In these days Iran is the greatest producer and exporter of saffron in the world and more than 65% of the world production of this expensive product is related to Iran. This expensive product of our country, because of the contact with soil, has a high microbial contamination for which especially at the beginning of the season the amount is higher than the permitted standard amount which is in microbial characteristics and test methods according to the national standard of Iran, No. 5689. In addition to that, the existence of larvae in saffron causes difficulties in exporting this valuable product. There are many methods which are recommended for the decontaminating of saffron such as ionization, microwave and fumigation. In this research, ozone was used as a disinfectant for saffron, which was attacked by pests and microorganisms. The aim is to omit or reduce the population of pests and microorganisms without any noticeable damage to the color, flavor and fragrance of saffron. An ozone generator which produced 5 g/h ozone was used. For the purpose of inactivating microbiological contamination of saffron, 4 levels of ozone in 4 times of 0, 1, 2, 3 hours was used. After using these conditions microbiological tests including total count of bacteria, coliform, mold and yeast and chemical analyses of main characteristics of saffron were carried out. The results were analyzed statistically. Moreover the samples were examined for the presence of living larvae, after using 4.7 ppm dosage of ozone. The results of this research showed that in the 4th level of ozone (input of pure oxygen to the ozone generator was 6 L/min) for 3 hours contact time of saffron with ozone, the number of total count of bacteria, coliform, mold and yeast decreased up to 93.3%, 99.8%, 96.9% and 84.5%, respectively. In the 4th level of ozone (input of pure oxygen to the ozone generator was 6 L/min) and in 3 hours contact time of saffron with ozone, the results of crocin, saffranal and picrocrosin estimation showed a decrease of 14.9%, 10.46% and 13.85%, respectively. The use of ozone (4.7 ppm) for 20 minutes annihilated almost 84% of larvae whereas further ozonation exposure (total time 40 min) had as result that nearly no larvae remained alive.