

Effects of Dehydration on the Bioactive Compounds of Waste Onion Leaves

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Waste onion leaves were found to possess flavor, aroma and bioactive components similar to that of onion bulb which are useful in various food applications making it a potential alternative spice. Although drying is known as a preservation technique for herbs such as onions, it is often accompanied with loss of volatiles and bioactive compounds. In this study, the changes in bioactive compounds of waste onion leaves in terms of total phenolic content (TPC) and total flavonoid content (TFC) as well as flavor and aroma components such as sulfur-containing compounds using various dehydration techniques (sun drying, conventional drying, freeze drying and vacuum drying) were evaluated. Effects of drying parameters such as temperature, time, vacuum pressure and blanching on preservation of bioactive compounds in waste onion leaves were also investigated. Results showed that vacuum drying is the most efficient drying technique in terms of moisture reduction and TFC preservation but not with TPC retention. Conventional drying showed favorable results on the preservation of TPC and TFC but failed to reduce the moisture of onion leaves below 15%. Heating had a positive effect on TFC of dried onion leaves except for sun drying. Sun drying showed comparable performance with freeze drying in preserving TPC, however, the color and appearance of sun-dried samples were not retained and the desired moisture was not attained. Longer drying time and increasing pressure resulted to a more favorable retention of TPC while blanching significantly reduced the TPC. A decrease in TFC was observed at increasing temperature and shorter drying time. Sulfur-containing compounds like alk(en)yl mono-, di-, and tri-sulfides onions, which contribute to the aroma of onion, were detected in all the dried samples. From these results, the type of drying method can significantly affect the bioactive components, as well as the flavor and aroma of dried onion leaves.

Keywords: bioactives, conventional drying, dehydration, flavonoids, freeze drying, gallic acid, onion leaves, phenolics, quercetin, thiosulfates, vacuum drying