ABSTRACT

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STUDY OF ANTIOXIDANT CHARACTERISTICS OF CIDER PREPARED FROM POMEGRANATE (PUNICA GRANATUM L.) FRUIT PEELS
(xiii + 103 pages : 8 figures, 9 tables, and 3 appendices)

It has been shown that pomegranate (Punica granatum L.) fruit peel that make up about 40% of the whole fruit contributed to the highest antioxidant activity among the peel, pulp, and seed fractions. This research was aimed to utilize the pomegranate fruit peel as a source of antioxidant in a fermented alcoholic beverage, i.e. cider and to determine the physicochemical and antioxidant characteristics of ciders during and after fermentation. Prior fermentation, pomegranate fruit peels were treated with two different blanching methods (i.e. steam and water blanching) and three different blanching time (i.e. 4, 6, and 8 minutes) which was aimed to inactivate the enzymes responsible for the oxidation of polyphenols. The selected blanching treatment of the fruit peels with the best antioxidant characteristics was six-minute-water Blanching. The alcoholic fermentation was subsequently carried out for 21 days with three different methods in cider making (i.e. unfiltered, filtered, and combination (1:1) of both). Methods in cider making and fermentation time affected all of the physicochemical and antioxidant characteristics of ciders. As the fermentation time increased, the antioxidant characteristics (i.e. TPC, TFC, and antioxidant activity), total titratable acidity (TTA), and alcohol content of ciders were increased with decrease in pH, and total dissolved solids (TDS). Unfiltered cider in the presence of pomace exhibited the best antioxidant characteristics. The filtered, pasteurized final cider exhibited alcohol content of 11.07±0.20% and antioxidant activity expressed as IC₅₀ of 37.09±5.16 mg/L, other parameters were TPC of 227.32±64.19 mg GAE/g sample, TFC of 38.71±4.10 mg QE/g sample, pH of 3.14±0.01, TTA of 13.53±0.66 g citric acid/100 mL, TDS of 8.52±0.85 ºBrix, and reducing sugar content of 0.79±0.37%. Taken all together, fermentation increased the values of certain parameters of antioxidant characteristics of pomegranate fruit-peel cider.

Keywords : Pomegranate fruit peels, Punica granatum L., antioxidant, blanching, cider, pomace, alcoholic fermentation

References : 66 (1989-2012)