

EFFECT OF PARTICLE SIZE AND CONCENTRATION OF POMEGRANATE (*Punica granatum* L.) PEEL POWDER ON SUPPRESSION OF OXIDATION OF EDIBLE PLANT OILS

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Lipid oxidation is an important process that affects the shelf life of edible oils. Oxidation produces off flavors, off odours and some compounds cause adverse health effects. Chemical mechanisms such as autoxidation, photo-oxidation and thermal oxidation are responsible for lipid oxidation. Refined, Bleached and Deodorized (RBD) coconut oil, Virgin Coconut Oil (VCO) and corn oil are widely used plant oils. Pomegranate fruit is known to possess high antioxidative efficacy. Peel of pomegranate contains high antioxidant activity than aril and pulp membrane. An experiment was carried out to study effects of particle size and concentration of pomegranate peel powder on the suppression of oxidation of RBD coconut oil, VCO and corn oil. Pomegranate peel powder was incorporated into each oil sample as micro (< 250 µm) and nano particle (280 - 300 nm) at 100 ppm and 200 ppm concentrations. The control sample of each oil was prepared, without pomegranate peel powder. The stability of oils during autoxidation was evaluated by storing oil at 60 °C for 28 days. The level of oxidation was assessed by peroxide value and thiobarbituric acid reactive substances on 0, 1, 3, 5, 7, 14 and 28 day, respectively. VCO containing pomegranate particles of 280 - 300 nm at 200 ppm showed the highest oxidative stability, followed by RBD coconut oil and corn oil. Results revealed that, 280 - 300 nm particle size of pomegranate peel powder at 200 ppm concentration was the best in mitigating oxidation of RBD coconut oil, VCO and corn oil. There is a huge potential of utilizing pomegranate peel powder as an antioxidant agent in reducing oxidation of edible plant oils.

Keywords: Antioxidant, Autoxidation, Micro particles, Nano particles, Pomegranate peel powder