

Effect of Star Fruit (*Averrhoa carambola*) Peel Extract on Oxidative Stability of Sesame (*Sesamum indicum*) Oil

Pereira, J.C., *Sivakanthan, S. and Vasantharuba, S.

Department of Agricultural Chemistry, University of Jaffna, Sri Lanka

*Corresponding E-mail: ssubajiny@univ.jfn.ac.lk

Star fruit (*Averrhoa carambola*) is one of the underutilized tropical fruits that belongs to Oxalidaceae family. Star fruit is valued as a rich source of polyphenol antioxidants and ascorbic acid. This study was carried out to evaluate the antioxidant potential of star fruit peel, a by-product, and its effect on oxidative stability of sesame (*Sesamum indicum*) oil. Acetone was used as the solvent to extract the antioxidant components. Total phenolic content and antioxidant potential of peel were determined after extraction for different duration (4, 6 and 24 hrs) at 200 rpm. The extract obtained after 24 h contained higher total polyphenolics (26.96 ± 2.28 mg GAE/g dry weight), antioxidant capacity (32.44 ± 5.22 mg AAE/g dry weight) and DPPH radical scavenging activity (IC₅₀ value - 0.61 mg/ml) than other extracts. Based on these results, extract of peel obtained after 24 hrs of extraction was used to determine its antioxidant effect at different concentrations (200, 500, 800 and 1000 ppm) on oxidation of sesame oil. ButylatedHydroxytoluene (BHT) at 200 ppm was used as the reference. Oil without added antioxidant was used as the control. Oxidation was carried out under accelerated oven storage (at 60 ± 5 °C) up to 14 days. Samples were collected on 1, 3, 7 and 14 days and evaluated for peroxide values (PV), *p*-anisidine values (AV), TOTOX values, free fatty acids (FFA), conjugated dienes (CD) and conjugated trienes (CT) to measure the levels of oxidation. Results of this study showed that the oil added with star fruit peel extract exhibited significantly higher stability against oxidation than the oil added with BHT and control. Furthermore, the stability oil against oxidation increased with increasing concentration of the peel extract. In conclusion, this study suggests that star fruit peel extract is a potential source of natural antioxidant to increase the oxidative stability of edible oils and can be used as a green alternative to synthetic antioxidants.

Keywords: Antioxidant capacity, Oxidative stability, Sesame oil, Star fruit, anti-oxident