

The Effect of Mangosteen (*Garcinia mangostana*), Cinnamon (*Cinnamomum verum*) and Chilli (*Capsicum annum*) Extracts in Minimizing Autoxidation of Sesame (*Sesamum indicum*) Oil

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Abstract: During the past two decades, the use of natural plant extracts as antioxidants in edible oils is becoming popular to prevent the use of synthetic antioxidants. This study was carried out to study the effect of three natural plant extracts; mangosteen (*Garcinia mangostana*) peel, cinnamon (*Cinnamomum verum*) and chilli (*Capsicum annum*) extracts on autoxidation of sesame (*Sesamum indicum*) oil. Dried powder (20 g) of each plant was mixed with 30 ml of acetone, stirred for 30 min at room temperature and filtered and the solvent was removed by rotatory evaporator to get plant extracts. Sesame oil was heated to 60 °C and plant extract was added at 5 mg per 100 mg of sample while stirring. Just after adding plant extracts, oil samples (5 mL) was taken into glass vials, flushed with nitrogen and closed with caps to assess the oxidative stability by accelerated oven storage test (at 65±5 °C for up to 28 days). Samples were drawn on 1, 3, 5, 7, 14, 21 and 28 days and analyzed for chemical parameters such as peroxide value (PV), thiobarbituric acid reactive substance (TBARS) assay and specific absorptivity of conjugated dienes (CDs) and conjugated trienes (CTs). All samples treated with plant extracts showed increased stability against autoxidation than control. The samples treated with mangosteen peel showed significantly ($p < 0.05$) lower rate of percent increment of PV, CDs, TBARS and CT (2.76, 0.84, 0.12 and 1.14%, respectively) than the samples treated with other extracts. The samples treated with cinnamon showed significantly ($p < 0.05$) higher percent increment of PV and CTs (3.18 and 1.97%, respectively) than the samples treated with chilli extract (2.99 and 1.42%, respectively) while CDs and TBARS values of samples treated with cinnamon extract were significantly ($p < 0.05$) lower than the samples treated with chilli extracts. Therefore it is concluded that all three plant extracts can act to reduce the autoxidation of sesame oil, however, the mangosteen peel extract is the most effective to reduce the autoxidation of sesame oil. Thus, mangosteen peel, a waste product, could be effectively used at low cost to increase the stability of sesame oil against autoxidation.

Keywords: oxidative stability, sesame oil, natural plant extracts, autoxidation