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Effect of some plant extracts in reducing oxidation of selected edible oils during deep frying

T. P. Hemachandra[1], R. R. G. D. K. Jayathilake[2] and T. Madhujith[3*]

[1]Postgraduate Institute of Agriculture, University of Peradeniya, Sri Lanka, [2]Postgraduate Institute of Science, University of Peradeniya, Sri Lanka, [3]Department of Food Science, Faculty of Agriculture, University of Peradeniya, Sri Lanka
[*]madujith@yahoo.com

The repeated use of edible oils leads to oxidative degradation of lipids which results in the development of objectionable odours, flavours, colours and more importantly, generates toxicants. The objective of the present study was to examine the efficacy of natural anti-oxidative extracts obtained from rosemary, oregano and pomegranate peel in mitigating the oxidation of coconut oil (CO), virgin coconut oil (VCO) and sunflower oil (SO). These edible oils were used for frying standard-sized potato strips in the presence of three different anti-oxidative extracts; namely, pomegranate peel powder, oregano and rosemary extracts, at 2% (w/w) level. A sample of oil (10 mL) was collected into a vial, flushed with nitrogen and stored at -18°C until analysis. Frying was repeated twice more with the same oil. Oil devoid of any extract was used as the control. The samples collected were analysed for peroxide value (PV) and thiobarbituric acid reactive substances (TBARS). Results revealed that both PV and TBARS values gradually increased with the frying cycle in all oil systems tested, indicating a gradual oxidation of oils with time. A significant ($P < 0.05$) inhibition of oxidation due to incorporation of additives was observed in all oil systems. A significantly ($P < 0.05$) high level of oxidation was observed in SO which is richer in unsaturated fatty acids than the saturated oils (VCO, CO). The PV ranged from 1.10 mmol/kg to 1.58 mmol/kg in SO devoid of any additive and this was reduced to 0.4 mmol/kg to 0.9 mmol/kg with the addition of pomegranate peel powder. Virgin coconut oil exhibited the highest level of resistance towards oxidation compared to CO and SO. A similar trend was observed with TBARS. The pomegranate peel powder exerted the highest resistance against generation of both primary and secondary oxidative products in edible oils compared to rosemary and oregano extracts. It can be concluded that anti-oxidative extracts such as pomegranate peel powder, oregano and rosemary extracts can effectively be used to mitigate oxidation of edible oils during frying.

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