

Oxidative Stability of Roasted Mustard Seed (High Erucic Variety) Oil

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High erucic mustard seed oil is one of the most common liquid cooking oil in India and Nepal. Roasting of seed prior to oil extraction is a common practice in these areas. This study was carried out to evaluate the oxidative stability of the roasted mustard seed oil.

At first, a potent radical scavenger formed during seed roasting was isolated and identified based on NMR, MS, UV and fluorescence spectra. The compound was found to be 2,6-dimethoxy-4-vinylphenol (also known as canolol) and was confirmed by chemical synthesis. The compound was isolated for the first time from roasted high erucic mustard seed oil. It was previously observed in the roasted low erucic mustard and rapeseed oil.

Furthermore, the oxidative stability of the different mustard seed oil samples collected from Nepalese market was evaluated. The different samples showed varying degree of oxidative stability and some samples were remarkably stable even for 3 months at 50 °C (dark). The differences in the oxidative stability among samples were only slightly correlated with the concentration of radical scavengers. Further study revealed that browning reaction markers (absorbance at 330 to 430 nm and fluorescence emission at 450 nm after excitation at 350 nm) showed high correlation with the oxidative stability. The browning reaction products were lipophilic, which indicated the possible involvement of lipids in the Maillard type reactions. The phospholipids content showed high correlation with both the browning reaction markers and the oxidative stability. This showed that the presence of phospholipids along with its possible browning reaction products (mainly due to amino group containing phospholipids) during heat treatments could play important synergistic role with canolol and tocopherols on the oxidative stability of the roasted mustard seed oil.