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Synergistic Effect of Cold Plasma on Antioxidant Properties and Fatty Acid Composition of Rice Bran

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Abstract : Low-pressure air plasma is used to investigate the antioxidant properties and fatty acid composition of rice bran at different power levels (40 W and 60 W). We observed partial hydrogenation of rice bran oil after the treatment. The fatty acid composition analysis by gas chromatography showed an increase of 28.2% in palmitic acid and a 29.4% decrease in linoleic acid. FTIR spectrum shows no new peak formation, which confirms negligible amounts of trans-fatty acids. There is a decrease in peroxide value and iodine value, which can be correlated to an increase in saturated fatty acids. The total polyphenolic content was observed to be increased by 20.1% after the treatment. There is an increase in reducing power and DPPH % inhibition of rice bran due to plasma treatment. This study shows cold plasma treatment can be considered an alternative technology for the hydrogenation of oils, replacing traditional toxic processes.

Keywords : cold plasma, rice bran, fatty acid composition, hydrogenation of oils, antioxidant properties
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