

ADDITION OF MANDARIN PEEL CV ARRAYANA PEEL EXTRACTS OBTAINED WITH SUPERCRITICAL FLUIDS TO MAYONNAISE AS A NATURAL ANTIOXIDANT

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ABSTRACT

Mandarin *cv arrayana* is a colombian citrus cultivar of high production in the country [1]. In this research the supercritical fluid extraction of mandarin *cv arrayana* peel, an agroindustrial residue, was evaluated, assessing the effect of temperature (50-80°C), pressure (120-220 bar) and co-solvent percentage (ethanol) (5-15%) in antioxidant activity (measured by DPPH method) and total phenol and flavanone content. For analyzing these effects a central composite experimental design was developed. These extracts were also tested as antioxidants in mayonnaise through an accelerated oxidation process at 60°C, having as a positive control the synthetic antioxidant BHA. The oxidation was monitored for six days with the measurement of hydroperoxides production and TBARS assay every two days. The extracts obtained were compared to soxhlet extraction in terms of the responses mentioned above. The results indicate that the temperature exerts the most significant positive effect on antioxidant activity, which is directly correlated with flavanone and phenol content and compared to soxhlet, SFE had better response, but less yield. For the mayonnaise oxidation assay it was found that some extracts (obtained at high temperature conditions as well) had a similar behavior to BHA during the six days, considering that they were added in a concentration of 500 ppm and BHA was added into its maximum permitted concentration according to codex Alimentarius recommendations, 140 ppm. However, this indicates the potential these extracts have to be used as antioxidants in mayonnaise, compared to soxhlet extraction, which had a less protective effect against oxidation and also compared to a synthetic antioxidant.

Keywords: mandarin peel, arrayana, antioxidant activity, mayonnaise, TBARS.

References

[1] Secretaría de Agricultura y Desarrollo Rural, “Estadísticas agropecuarias. Volumen 24,” Bogotá D. C., 2014.