



IDENTIFICATION AND CONTROL OF BLACK COLOUR SPECK FUNGAL FORMATION IN VIRGIN COCONUT OIL

H.N. Fernando¹, T.G.G. Uthpala¹✉, D.C. Wettimuny^{1,2}, U.H.A.J. Hewawansa^{1,3}, S.B. Navaratne¹

¹Department of Food Science and Technology, Faculty of Applied Sciences, University of Sri Jayewardenepura, Sri Lanka

²Department of Biosystems Technology, Faculty of Technology, University of Sri Jayewardenepura, Sri Lanka

³Department of Chemistry and Biotechnology, Faculty of Science, Engineering and Technology, Swinburne University of Technology, Hawthorn, Victoria, Australia

✉gimhani@sci.sjp.ac.lk

<https://doi.org/10.34302/crpjfst/2021.13.2.10>

Article history:

Received,
29 July 2020
Accepted,
22 May 2021

Keywords:

Virgin Coconut Oil;
Mould growth;
Black specks;
Contamination;
Aspergillus sp.;
Heat and UV.

ABSTRACT

A critical issue in virgin coconut oil (VCO) industry is fungal contaminations which leads to black colour speck formation. This study was designed to distinguish the type of fungal growth and to determine the remedial actions. VCO was extracted by cold press method and subjected to eight treatments. Efficacy of the treatments were evaluated in terms of changes in microbial properties [yeast and mould count (YMC) and aerobic plate count (APC)], physicochemical properties [moisture and volatile matter% at 105°C (MV), specific gravity at 30°C (SG), saponification value (SV), iodine value (IV), peroxide value (PV), acid value (AV), relative fatty acid profile (RFAP) by gas chromatography and free radical scavenging activity (DPPH assay)] along with a non-treated sample. The results revealed presence of *Aspergillus sp.* as the black colour speck in VCO and among those treatments the combination (X2) where VCO was subjected to 65°C, 253.7nm UV radiation for 60 seconds was identified as the best because it gave a null YMC, 15CFU/mL in APC, 0.12±0.01 in MV %, 0.9194±0.00 in SG and it was within the APCC standards. Further, IV, SV, PV and AV were obtained as 5.52±0.37mg/g, 262.55±0.16mg KOH/g, 2.96±0.02 Meq/kg and 0.14±0.04mg/g respectively. The X2 sample showed a higher lauric acid percentage (50.489±0.011) compared to the non-treated (NT) sample (49.646±0.001). A lower EC₅₀ value was noted in X2 (3.27±0.01mg/L) compared to NT (3.27±0.01 mg/L) sample. Evidently, the present results suggest that combination of heat, UV radiation with time has a significant influence on retarding the black speck formation in VCO.