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PII: S0896-8446(15)30160-1
DOI: http://dx.doi.org/doi:10.1016/j.supflu.2015.10.015
Reference: SUPFLU 3484

To appear in: *J. of Supercritical Fluids*

Received date: 17-8-2015
Revised date: 21-10-2015
Accepted date: 22-10-2015

Please cite this article as: I. Deniz, M.O. Ozen, O. Yesil-Celiktas, Supercritical fluid extraction of phycocyanin and investigation of cytotoxicity on human lung cancer cells, *The Journal of Supercritical Fluids* (2015), http://dx.doi.org/10.1016/j.supflu.2015.10.015

Supercritical fluid extraction of phycocyanin and investigation of cytotoxicity on human lung cancer cells

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Abstract

In this study, a step-by-step optimization approach was carried out for supercritical fluid extraction (SCF) of phycocyanin (PC) from *Spirulina platensis*, where pressure, temperature, co-solvent ratio and process duration were investigated. The elicited parameters were 250 bar, 60ºC, 10% ethanol as co-solvent at a dynamic duration of 45 min yielding PC amount of 90.74% and PC purity of 75.12%. Extracts obtained with SCF were tested against lung cancer cell line (A549) to determine cytotoxicity and compared to that obtained from solvent extraction. SCF extract had an IC_{50} value of 26.82 µg/mL, whereas that value was 36.94 µg/mL for solvent extract indicating a lower cytotoxic effect. Overall, the results revealed significant information for PC extraction using supercritical fluids as an alternative to conventional methods and the possibility to include PC in daily diet for preventive purposes against highly lethal lung cancer.

Keywords: Supercritical fluid extraction; *Spirulina platensis;* phycocyanin; cytotoxicity; A549 lung cancer cells.

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