

Investigation of potential application of single wall carbon nanotube in piperine separation and purification from black pepper ethanolic extract

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Background and Aims: The potential application of single wall carbon nanotube (SWCNT) in the separation and purification of piperine from black pepper ethanolic extract was evaluated by HPTLC analysis of the adsorbed and desorbed piperine using this nanotube. Based on this result a method for purification of the piperine extracted from black pepper was introduced.

Methods: Piperine was extracted from black pepper by maceration. An ethanolic suspension of SWCNT was injected into a disk and the extract was passed through it. Box behnken design was used as a method of multivariate optimization to optimize the extent of piperine purification by SWCNT. The purification of the piperine was determined by HPLC-DAD analysis of the desorbed piperine at 340 and 254 nm.

Results: SWCNT at optimized condition could separate and purified piperine extracted from black pepper over 90 per cent. It was shown that chloroform was the best solvent for piperine desorption.

Conclusions: The present study demonstrated a rapid and reliable enriched technique for separation and purification of piperine from black pepper extract.

Keywords: Black pepper; Piperine; HPLC-DAD; SWCNT; HPTLC