

ABSTRACT

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STUDY OF ANTIOXIDANT ACTIVITY OF CURCUMIN-BASED PYRANO[2,3-D]PYRIMIDINE AS MODIFIED CURCUMIN

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Curcumin has been described as a polyphenolic compound having a great potential as source of antioxidant. Several studies showed that modification of curcumin's α,β -unsaturated 1,3-diketone moiety was found to improve the antioxidant properties over curcumin. The aim of this research was to conduct modification of curcumin and study the antioxidant activity of the modified compound. The modified curcumin using benzaldehyde and barbituric acid was treated with or without solvent and used different catalyst (citric acid) concentrations which were 5, 10, 20, and 25 mmol%. Yield and TLC parameters were analyzed for all modified curcumin generated and the result showed that ethanol (with solvent) method and 20 mmol% catalyst concentration with percentage of yield of $99.3581 \pm 0.2873\%$ and clear TLC spots was chosen as the best combination for the next modification using different β -diketone compounds which were curcumin and dimedone and different type of aldehydes which were benzaldehyde and cinnamaldehyde. Yield, TLC, and antioxidant activity parameters were assessed for all modified products combined with characterization using UV-Vis spectrophotometry. This study showed that curcumin cinnamaldehyde which had percentage of yield of $47.4831 \pm 2.7032\%$, clear TLC spots, the longest maximum wavelength of 416 nm, and the highest antioxidant activity of $IC_{50} 18.2130 \pm 2.8766$ mg/L was chosen. Curcumin cinnamaldehyde was compared to commercial curcumin and showed lower antioxidant activity. Curcumin cinnamaldehyde was also characterized for the chemical structure and mass spectrum by using LC-MS. The result showed that the expected molecular weight was present meaning that there were changes in the chemical structure and mass of modified curcumin.

Keywords: Antioxidant activity, benzaldehyde, cinnamaldehyde, curcumin, dimedone, modification

References: 58 (1997-2017)