

Curcuminoids from *Curcuma xanthorrhiza* Roxb: Isolation, Characterization, Identification, and Analysis Of Antioxidant Activity

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ABSTRACT

Curcuma xanthorrhiza Roxb. (**Temulawak**) is a plant used in traditional drugs. Curcuminoid, essential oil, and starch are found as the main components in this plant. Curcuminoid is a natural product with phenolic compounds of diarylheptanoid group, characterized as 1,7-diarylheptane as the basic structure. Curcuminoid has active sites and known as antioxidant for a long time. A group of curcuminoid compounds consist of three main compounds, which are curcumin (diferuloyl methane), demethoxycurcumin (p-hydroxysinamoylferuloylmethane), and bis demethoxycurcumin (p-hydroxysinamoylferuloylmethane). The aim of this research is to isolate and to identify curcuminoid from *Curcuma xanthorrhiza* Roxb (*temulawak*) rhizome and to evaluate the antioxidant activities. This research consists of three steps, including (1) isolation and purification curcuminoid components by maceration and soxhlet extraction, then continued by column chromatography (CC); (2) characterization and identification of curcuminoid components by thin layer chromatograph (TLC) and spectroscopic methods, and (3) assay and evaluation of antioxidant activity by DPPH methods. The result of this research is described below. The maceration and extraction processes yielded a yellow-orange solid, with m.p 164168°C and the analysis by TLC shows five spots, and three spots are dominant. This substance was showing active as antioxidant with EC_{50} 47.9 ppm on sixtieth minute. From the purification of this substance by CC and spectroscopic analysis, the three main compounds were found. The result of antioxidant assay on sixtieth minute were (1) curcumin (solid, yellow-brown, m.p 9194C, EC_{50} 103.70 ppm), (2) demethoxycurcumin (powder, yellowis-brown, m.p 8083°C, 99.25 ppm), and (3) bis demethoxycurcumin (needle crystal, yellowishorange, m.p 182183 °C, EC_{50} 55.14 ppm). Base on EC_{50} , the isolated curcuminoid is more active than its each component: curcumine, demethoxycurcumine, and bisdemethoxycurcumine.

Keywords: bisdemethoxycurcumin *Curcuma xanthorrhiza* Roxb, curcumin, demethoxycurcumin