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Cytotoxic Activity of Acetone and Ethanol Overripe Tempe Extracts against MCF-7 Breast Cancer Cells and Their Antioxidant Property

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Abstract : Tempe is a functional food prepared from soybeans through Rhizopus spp fermentation. It is well known as functional food, originated from Indonesia. Most studies on tempe functionalities refer to ripe (48 h fermentation) tempe and only limited studies discuss overripe tempe while longer fermentation time possibly increased tempe health benefit. Hence, the present study was performed to investigate the cytotoxic activity againts MCF-7 breast cancer cells and antioxidant property of tempe prepared from 0–156 h of fermentation. Tempe samples were dried and extracted with acetone and ethanol, respectively. Their extracts were used for subsequent analysis. The cytotoxic activity was assessed on MCF 7 breast cancer cells using Alamar Blue method. The antioxidant activity was determined by DPPH free radical scavenging assay. The results indicated that acetone extracts of 108 h tempe had a potent cytotoxic activity against MCF-7 breast cancer cells (IC50 = 2.54 ± 0,30 µg/mL). Ethanol extracts of 108 h tempe also showed the potency, but at slightly higher IC50 (5.20 ± 1.01 µg/mL). Both acetone and ethanol extracts of 108 and 120 h tempe showed high antioxidant activity expressed as percent inhibition with no significant difference. However, acetone extracts of 120 h tempe (81.31 ± 3.70 %) had better ability to inhibit oxidation reaction than that of ethanol extracts (75.77 ± 6.00 %). It can be concluded that the cytotoxic activity of tempe from 0–156 h of fermentation is positively correlated to their corresponding antioxidant property. Longer fermentation time, up to 108 h, increased the ability of tempe to inhibit the growth of MCF-7 breast cancer cells and oxidative reaction. But extended fermentation time, up to 156 h, tends to decrease its ability. Further studies are encouraged to identify the active components contained in each extract.

Keywords : antioxidant property, cytotoxic activity, extracts, overripe tempeh
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