

Abstract

Burkea africana Hook (Caesalpiaceae) is a small to medium deciduous flat-topped tree up to 20 m tall that grows in Western and Southern Africa. Traditionally the bark decoction is used in treatment of fever, inflammation and cancer.

Cytotoxic activity of the ethanolic extract was investigated using brine shrimp lethality assay, 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay using HeLa cells, cell cycle analysis, histone 3 phosphorylation, Caspase 3 and 8 activity, Annexin-V/FITC activation and mitochondrial membrane depolarization using DiOC6 dye.

Burkea africana was not toxic to brine shrimp larvae with an LD50 value of 631 µg/mL, while significant growth inhibition was observed in HeLa cells with an IC50 value of 61.4 µg/mL. Cell cycle arrest occurred at the G2/M phase, with large increase being observed at the sub-G1 phase, ($1.9 \pm 0.0\%$ and $3.3 \pm 0.0\%$) control to extract treated cells ($14.2 \pm 1.1\%$ and $29.8 \pm 0.8\%$) after 24 and 48 h. Phosphorylation of histone H3 by the extract ($43.86 \pm 5.63\%$) when compared to control ($6.35 \pm 2.15\%$) indicates that arrest occurs at the M phase of the cell cycle. *Burkea africana* activated caspase 3 and caspase 8 after treatment for 24 and 48 h. Apoptotic cell death was evident in cells treated with *Burkea africana* after 30 h ($15.3 \pm 3.5\%$) when compared with untreated cells ($3.5 \pm 0.5\%$). *Burkea africana* also promoted mitochondrial membrane depolarization as observed in DiOC6 stained cells. These results show for the first time that there are compounds in the extract of *Burkea africana* with apoptotic effects towards HeLa cells.