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In vitro cytotoxicity assay of Sauropus androgynus on human mesenchymal stem cells

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Abstract

Sauropus androgynus is a well-known Indonesian medicinal herb that is used extensively to increase human breast-milk production. However, many studies have also revealed side effects associated with bronchiolitis obliterans in Taiwan and Japan. The present study evaluated the in vitro toxic effects of S. androgynus on human mesenchymal stem cell culture derived from bone marrow (hMSCs-BM). This is the first report of a cytotoxicity assay of S. androgynus extracts from Indonesia. After 72 hours of incubating cell cultures with varying concentrations of extracts (250–2500 mg L−1), cytotoxicity was assayed by the reduction of 3-(4,5-dimethyl- thiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) and reported in terms of cell viability. The apoptotic effects of the extract were determined by a terminal deoxynucleotidyl transferase-mediated dUTP-biotin nick end labeling (TUNEL) colorimetric assay. The S. androgynus methanol extract from East Java, Indonesia, was less cytotoxic to hMSCs-BM with an IC50 of 2450 mg L−1, but it could inhibit cell viability via the apoptosis pathway. A sample extract of plants collected near Purwosari had the lowest hMSCs-BM viability percentage (37%), while the extract from plants collected near Surabaya Pusat had a cell viability of 75%. Further studies are required to investigate the metabolites in S. androgynus that are highly correlated with its toxic effects.

Keywords: in vitro cytotoxicity, Sauropus androgynus, human mesenchymal stem cells, apoptosis, safety assessment