ABSTRACT

Amorphophallus campanulatus (Roxb.) Blume, belonging to the family of Araceae, is a tuber crop commonly known as elephant foot yam. A. campanulatus tubers are traditionally used in inflammations, colic, piles, hemorrhoids, liver diseases and abdominal tumors. The present study was undertaken to evaluate the in vitro and in vivo antioxidant and anticancer effect of A. campanulatus tuber and the identification of its active phytochemical constituents.

Preliminary phytochemical evaluation of the methanolic extract of A. campanulatus tuber (ACME) revealed the presence of alkaloids, tannins, glycosides, phenols, flavonoids, saponins and carbohydrates. In addition, ACME exhibited a promising in vitro antioxidant activity. The in vivo studies also revealed that ACME possesses potent antioxidant and hepatoprotective activity against thioacetamide (TAA) induced oxidative stress in rats. Further, the LC-MS analysis for the phytochemical profiling of ACME revealed the presence of eight major phytochemicals with proven antioxidant/cytotoxic/anticancer properties viz., Cinnamaldehyde, Ferulic acid, Retinol, Quercetin, Quercetagetin, 1-Caffeoyl-β-D-glucose, Triacontanol and Asiatic acid. Hence, further studies were conducted to establish its anticancer efficacy particularly its chemopreventive activity against colon and liver cancer. In view of this, we have evaluated the chemopreventive potential of ACME against 1, 2-dimethylhydrazine (DMH) induced colon carcinogenesis and N – Nitrosodiethylamine (NDEA) induced hepatocellular carcinoma in rats. The results indicated that ACME could exert a significant chemopreventive effect on experimental colon and liver cancer. The dose-dependent cytotoxic and apoptotic activities of the sub fractions of ACME viz. petroleum ether
fraction (PEF), chloroform fraction (CHF), ethyl acetate fraction (EAF) and methanolic fraction (MEF) were also studied in human hepatoma, PLC/PRF/5 cells and human colon carcinoma cell line HCT-15. Among the sub fractions of ACME, a pronounced result of chemopreventive activity were observed in the cells treated with CHF, whereas, EAF and MEF treated cells exhibited a moderate result and the least effect were observed in PEF treated cells. LC-MS analysis of the most promising chloroform fraction of ACME revealed the presence of ferulic acid, a phenolic compound reported to possess antiproliferative activity.

The present study concluded based on the findings that *A. campanulatus* tuber possess excellent antioxidant and anticancer properties. Furthermore, it is demonstrated that ACME is a promising chemopreventive agent particularly against colon and liver cancer and might be useful clinically after further molecular chemopreventive studies.