ABSTRACT

Indian medicinal plants (*Hibiscus rosasinensis, Cassia auriculata, Punica granatum and Moringa oleifera*) known for its various medicinal properties. The present study was to identify and characterize the anticancer compound from the petals of *Hibiscus rosa sinensis*. The preliminary phytochemical screening of petals of four different selected plants revealed the presence of flavanoids, alkaloid, saponins, tannins and polyphenols. TLC studies of aqueous methanol extract of petals of four selected plants were performed and the spots were visualized under 240 nm and 360 nm. In the present study the aqueous methanol extract of petals of four medicinal plants were investigated with various antioxidant systems. The results indicated that, among the four medicinal plants, *H. rosa sinensis* possessed abundant phenolic and flavonoids contents and exhibited excellent antioxidant activities. The flavanoid was extracted successively with petroleum ether, chloroform and ethanol from the petals of *Hibiscus rosa sinensis*. Flavonoid contents were determined by the method of Harborne (1998) and the extracts were analysed by means of TLC. After extraction, a TLC bioautography method was done to evaluate the antioxidant activity of aqueous methanol extract of *Hibiscus rosa sinensis*. The GC–MS analysis showed a variety of phenolic compounds. The antioxidant compounds were isolated from the petals of *Hibiscus rosa sinensis* by Silica Gel G Column chromatography. The isolated compounds C3, C4 & C5 were analyzed for antioxidant activity. The C5 compound shows the highest antioxidant activity compared to C3 & C4. The GC–MS analysis showed a variety of phenolic compounds. The structure of flavanoid compound was characterized as Hibiscetin-3-glucoside by Infra Red, Mass Spectrum and Nuclear Magnetic Resonance. The isolated compound treated VERO cell line showed 86% cell viability whereas IC₅₀ value 51.5% was observed against human breast cancer cell line MCF-7. The cell viability of MCF-7 breast cancer cells was determined by Trypan blue exclusion assay. The result indicates that the isolated compound, Hibiscetin 3-glucoside showed the reduction in cell viability in a dose dependent manner. The morphological changes in Human Breast cancer cell line MCF-7 with acridine orange/ethidium bromide staining exhibits apoptosis.
Flow Cytometry analysis revealed that the isolated compound, Hibiscetin 3-glucoside from *Hibiscus rosa sinensis* caused a significant arrest of cells at G2/M phase (G2/M arrest) and increased sub-G0 phase indicating induction of apoptosis. The compound treated cells exhibited DNA fragmentation (180bp cleavage) and RT - PCR studies showed significant increase in mRNA expression of Hibiscetin-3-glucoside compound treated cells. The present study revealed Hibiscetin 3- glucoside compound exhibiting its cytotoxic potential on breast cancer by inducing apoptosis and can be effectively used as anticancer agents.

**Keywords:** *Hibiscus rosa sinensis*, Breast cancer cell line MCF-7, anticancer compound, Hibiscetin 3-glucoside.