ABSTRACT

Woodfordia fruticosa Kurz. (syn. Woodfordia floribunda Salisb.) belonging to the family of Lythraceae, is a much branched beautiful shrub with brilliant scarlet flowers. The flowers are used in the preparation of Ayurvedic fermented drugs called “Aristhas” (hot extraction followed by month-long slow fermentation) and “Asavas” (cold percolation followed by month-long slow fermentation). All parts of the plant possess valuable medicinal properties viz anti inflammatory, anti tumour, hepatoprotective and free radical scavenging activity but flowers are in maximum demand. The dried flowers are used in the treatment of a wide variety of disorders such as dysentery, sprue, rheumatism, hematuria, hemorrhoids, derangement of liver, as tonic in disorders of mucous membrane etc. in Indian traditional system of medicine. The present study was undertaken to evaluate the antioxidant, antifibrotic and anticancer effect Woodfordia fruticosa Kurz flowers and the identification of its active phytochemical constituents.

Preliminary phytochemical evaluation of methanolic extract of W. fruticosa (MEWF) revealed the presence of phytochemical constituents such as alkaloids, flavonoids, phenols, tannins, glycosides, saponins, carbohydrates, proteins and amino acids. In addition MEWF exhibited promising in vitro antioxidant activity. LC-MS analysis for the phytochemical profiling of MEWF revealed the presence of phytochemicals with proven antioxidant/hepatoprotective/cytotoxic/anticancer properties. Hence further in vivo studies were conducted to evaluate the antioxidant, antifibrotic and anticancer properties of MEWF. In vivo studies demonstrated the potent antioxidant and hepatoprotective activity of MEWF against thioacetamide (TAA) induced oxidative stress in rats. Antifibrotic potential of MEWF was
evaluated in carbon tetrachloride (CCl₄) induced hepatic fibrosis in male Wistar rats in preventive and curative models. In both the experimental groups MEWF exerted significant antifibrotic effect in a dose dependent manner. Anticancer efficacy was tested against N-nitrosodiethylamine (NDEA) induced hepatocellular carcinoma in rats. MEWF could exert a significant anticancer effect on experimental liver cancer. The dose-dependent cytotoxic and apoptotic activities of the subfractions of MEWF 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. Among the subfractions of MEWF, 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 MEWF revealed the presence of confertin, a compound reported to possess antitumour activity.

The present study concluded based on the findings that *W. fruticosa* flower possess excellent antioxidant, hepatoprotective, antifibrotic and anticancer properties. Furthermore, it is demonstrated that MEWF is a promising chemopreventive agent particularly against liver cancer and might be useful clinically after further molecular chemopreventive studies.