

ABSTRACT

Background & Objectives: *Gmelina arborea roxb* commonly known as ‘Gambhari’ tree, the various parts of the plants are widely used in diarrhoea, anti-pyretic, thirst, anemia, leprosy, ulcers, consumption, strangury, vaginal discharges. Cancer is one of the major causes of death. It may affect people at all ages, even fetuses, but the risk for most varieties increases with age. Cancer causes about 13% of all deaths. Chemotherapy is a major treatment modality for cancer. Most of the chemotherapeutic agents exhibit several normal tissue toxicity accompanied by undesirable side effects and many of the potent antineoplastic drugs are highly expensive, mutagenic, carcinogenic and teratogenic. Herbal medicine is inexpensive and can be affordable by all the section of society. The objective of the present study is to evaluate the anti cancer effect of aqueous extract of leaves of *Gmelina arborea roxb* (AEGA).

Methods: The anti cancer effect of AEGA was evaluated by using different experimental models such as micronucleus test (using mice bone marrow), Ames assay (using *Salmonella typhimurium*), MTT assay, Cell viability assay, DNA fragmentation and clonogenic assay (using HL-60 cells). AEGA were used in the doses of 286 mg/kg and 667 mg/kg on micronucleus test and 5, 10, 15 and 20 mg/ml in Ames assay, MTT assay, Cell viability assay, DNA fragmentation and clonogenic assay.

Results: The AEGA significantly increased the % micronucleated polychrometics at doses of 286 mg/kg and 667 mg/kg, after 24, 48 72 h time interval. AEGA, produced dose dependent increased in the revertants/plate and MI in the two different strains of *S. typhimurium*, with or without metabolic activation. All the used concentrations of AEGA very significantly decreased the percentage MTT reduction. AEGA showed concentration

and time dependent effect in try pan blue exclusion assay, the cell viability was decreased very significantly compared to the control cells. In DNA fragmentation, cytotoxic activities of AEGA were observed to occur in a dose-dependent manner in HL-60 cells. The characteristic DNA fragment 'ladder' formation was observed. In the semisolid culture, the number of colonies decreased in a dose-dependent manner in all used concentration. AEGA effectively reduced the malignancy and suppressed the regeneration potential of HL-60cells.

Interpretation & Conclusion: The present study demonstrated that the aqueous extract of leaf of *Gmelina arborea roxb* possess anti-cancer activity. This effect might have been mediated by apoptosis mechanisms.

Key words: *Gmelina arborea roxb*; anti cancer; apoptosis.