**Abstract**

**Background & Objectives:** Cancer is a general term used frequently to indicate

various types of malignant neoplasms, most of which invade surrounding tissue and may

metastasize to several sites. Many Ayurvedic herbal drugs have been listed with possible

antineoplastic activity. Sadafuli (Catharanthus roseus) – vinblastin, vincristin; Talispatra

(Taxus bravifolia) – Taxol; are the few examples of plant based anticancer drugs. Basella

rubra L. is one of the edible herbs among that list, on which very less research work i.e.

antiulcer, antifungal, target for HIV and splenocyte proliferation activities have been

reported but no report about its anticancer activity is available. Hence, the present work is

proposed to evaluate the anticancer activity of leaves of Basella rubra Linn.(AEBR) and

its influence on anticancer effect of Cyclophosphamide.

**Methods:** HL-60 (Human promyelocytic leukemia) cell lines and BHK-21 cell lines

were obtained from NCCS, Pune and were cultured in RPMI-1640 and DMEM growth

medium respectively supplemented with 10% FBS. The cytotoxic and antiproliferative

effect of Basella rubra L. in the doses of 50-500 μg/ml on HL-60 cancer cells and BHK-

21 normal cell lines was determined by MTT assay, Trypan blue exclusion method,

Clonogenic Assay and DNA fragmentation was observed using gel electrophoresis.

AEBR was used in the doses of 285.7 mg/kg and 666.6 mg/kg body weight of mice for

Glutathione and Catalase estimation. Mutagenicity of AEBR on Salmonella typhimurium

TA98 and TA100 Strains was determined by AMES assay.

**Results:** The maximum decrease in percentage GSH was observed with the

combination of AEBR (666.6 mg/kg) and cyclophosphamide (100 mg/kg) and the level

of catalase significantly increased in all treated groups compared to tumour induced

control group on 6th, 10th and 15th day of cancer induction. AEBR produced dose

dependent increase in the revertants/plate in two different strains (TA98 and TA100) of S.

typhimurium, with and without metabolic activation mixture (S9 mix). All the used

concentrations of AEBR very significantly (p<0.01) decreased the percentage cell

viabiity. AEBR showed dose and time dependent effect in trypan blue exclusion assay,

the percentage cell viability was decreased very significantly (p<0.01) compared to the

control cells. In DNA fragmentation, cytotoxic effect of AEBR was observed in a dosedependent

manner on HL-60 cell lines. 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 concentrations of AEBR.

Conclusion: The present study demonstrated that the aqueous extract of leaves of Basella

rubra Linn. possesses anti-cancer activity. This effect might have been mediated by

apoptosis mechanisms.

**Key words:** Basella rubra Linn, Anti- proliferative effect, apoptosis.