

Effect of *Solanum nigrum* leaf extract on the non-enzymic antioxidant profile of experimental mice induced with tumour

P. RADHA, P.R. PADMA AND S. SUMATHI

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SUMMARY

Free radicals are the main contributing factor in most of the diseases. Antioxidants help in eradicating the effects of free radicals. In the present study, the hypothesis that *Solanum nigrum* leaf extracts are equipped to scavenge Reactive Oxygen Species (ROS) in tumour bearing mice was tested. The oxidative status of liver of female Swiss Albino mice (6-8 weeks old) subjected to DLA injection intraperitoneally and subsequent oral administration of *Solanum nigrum* leaf extract (500 mg/kg) for 21 days was studied. The antioxidant activity of leaves of plants bearing red berries and black berries was assessed by analyzing the non-enzymic antioxidants and by 2, 2'-diphenyl picryl hydrazyl (DPPH) assays. Vitamins A, E, C, reduced glutathione and protein thiols level and DPPH scavenging activity decreased significantly in DLA injected mice. Administration of *Solanum nigrum* leaf extracts was found to elevate the antioxidants level. Black berry leaf extract showed higher antioxidant potential than red berry leaf extract except in reduced glutathione assay where red berry leaf extract showed a higher activity than black berry leaf extract. The results suggest that *Solanum nigrum* leaves are a potential source of antioxidant and help in quenching ROS levels.

Key words : DLA, *Solanum nigrum*, Non-enzymic antioxidants

Oxygen Free Radicals (OFR) produced at metabolic sites are neutralized by non-enzymic scavengers such as certain vitamins or converted into non-harmful products such as water by the action of detoxifying enzymes such as superoxide dismutase, catalase, oxidases, etc. (Das, 2002). When the equilibrium between the radicals (oxidants) and antioxidants shifts towards the oxidants, the condition, which arises, is known as oxidative stress (Schaller, 2005). Accumulation of ROS is very dangerous to health. Antioxidants have the capacity to prevent, delay or ameliorate many disorders (Delanty and Dichter, 2000). Antioxidants can be derived either directly or indirectly from the diet. Plant and plant products have been used as a source of medicine for a long time. Human beings rely on traditional medicine for their primary health care need for a long time (Ranga *et al.*, 2005).

Solanum nigrum also called black night shade and petty morel belongs to the family *Solanaceae*. It grows to a foot or so in height and is highly branched. The leaves are egg shaped and stalked and the stem is green and hollow. *Solanum nigrum* has been found to exhibit hydroxyl radical scavenging capacity (Kumar *et al.*, 2001).

It has been used as a medicinal plant for a long time. The fruits of *Solanum nigrum* have been found to possess protection against gastric ulcers (Jainu and Devi, 2006). It has been found to be protective against ROS induced disorders such as cirrhosis (Huseini *et al.*, 2005). This study was designed to specifically investigate the antioxidant efficacy of *Solanum nigrum* leaf extract by investigating non-enzymic antioxidants in Swiss Albino mice liver tissue when it is administered *in vivo*.

MATERIALS AND METHODS

Experiments were carried out on female Swiss Albino mice (6 – 8 weeks old) of 25 – 30g body weight, which were procured from Small Animal Breeding House, Kerala Agricultural University, Thrissur. The mice were maintained under standard laboratory conditions. They were placed in polypropylene cages bottomed with husk, maintained at room temperature and were given standard rat feed pellets supplied by M/s. Hindustan Lever Ltd., Bangalore, India and water *ad libitum*. The mice were first randomized into various groups and then acclimatized for a period of 1 week in the new environment before the experiments were carried out.

Preparation of plant extract:

Fresh leaves of *Solanum nigrum* were collected from plants grown in pots. The leaves were cleaned under running tap water and dried with filter paper. 1 g of the leaves was chopped finely, ground to a smooth paste with

Correspondence to:

P. RADHA, Department of Biochemistry, Biotechnology and Bioinformatics, Avinashilingam University of Women, COIMBATORE (T.N.) INDIA

Authors' affiliations:

S. SUMATHI AND P.R. PADMA, Department of Biochemistry, Biotechnology and Bioinformatics, Avinashilingam University of Women, COIMBATORE (T.N.) INDIA