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Radical scavenging activity of different extracts of *Withania somnifera* leaves

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SUMMARY

The free radical scavenging activity of the different leaf extracts namely, methanolic,chloroform and ethanolic of aswhagandha (*Withania somnifera*) were evaluated .The results revealed that among the three different leaf extracts of *W. somnifera*, methanolic extract exhibited more DPPH scavenging activity. The extent of ABTS radical scavenging was more effective in methanolic extract, the aqueous extract of the leaves decreased the effect induced by H_2O_2 marginally, albeit to a statistically significant extent. The methanolic extract of *W. somnifera* showed better scavenging of H_2O_2 than the other two extracts. It was observed that extracts were very effective in preventing the lipid peroxidation in the three membrane model sytems studied to a significant extent over the oxidant-challenged system. Here, again the results confirmed the findings with methanolic extract performing better compared to aqueous and chloroform extract. Though the components that elicit these responses are extracted into all solvents employed (water, methanol and chloroform), the most active principle seemed to concentrate in the methanolic extract.

Key words : Free radicals, Radical scavenging activity, Lipid peroxidation, *Withania somnifera*

Oxygen is essential for survival however, its univalent reduction generates several harmful reactive oxygen species (ROS) inevitable to living cells and highly associated with wide range of pathogenesis such as diabetes, liver damage, inflammation, aging, neurological disorder and cancer (Tripathi and Kamat, 2007).The high levels of reactive oxygen species and free radicals cause damage to nucleic acid, proteins and membrane lipids, the antioxidants in diet would terminate attacks by the free radicals and reduce the risk of these diseases (Terashima *et al.*, 2007).

Antioxidant compounds may function as free radical scavenger, complexers of pro-oxidant metal reducing agents and quenchers of singlet oxygen formation (Rajeswar *et al*., 2005). Antioxidants may offer resistance against the oxidative stress by scavenging the free radicals, inhibiting the lipid peroxidation and by other mechanisms and thus prevent disease (Baskar *et al*., 2006).

Medicinal plants, which form the back bone of traditional medicine, have in the last few decades been the subject for very intense pharmacological studies. This has been brought about by the acknowledgement of the value of medicinal plants as potential source of new compounds of therapeutic value and as sources of lead compound in the drug development (Kumar *et al.*, 2006). One such popularly used plant that is reported to have anti-tumour, radiosensitizer, anti-stressor, immunomodulatory, anti-inflammatory and antibacterial effects is *W.somnifera* Dunal, which is commonly known as Ashwagandha (Padmavathy *et al.*, 2005).

In all these medicinal preparation, it is the dry tubers that are exploited. Previous studies conducted in our laboratory showed the leaves and fresh tubers are also good sources of antioxidants and radical scavengers (Sumathi and Padma, 2008). The results were also confirmed using *in vitro* and *in vivo* models. In order to better understand the component responsible for all these activities, three different extracts of leaves in polar and non-polar solvents were analysed in the present study.

MATERIALS AND METHODS

W.somnifera noted for its medicinal property was maintained in medicinal plant garden of our University and leaves were taken as the sample for our study. The leaves were collected and washed in running tap water to remove the surface contaminants. The washed leaves were homogenized in three different solvents namely, water, methanol and chloroform using a micropestle. The homogenate was centrifuged at lower rpm to clarify the extract. The supernatant corresponding to the concentration of 1mg/µl was used for assay. The extracts were tested for their ability to scavenge the free radicals. The free radicals scavenging effects of the *W.somnifera* leaf extracts was assessed by analyzing its ability to scavenge DPPH, ABTS and hydroxyl radicals and antioxidant potential against the non-radical oxidant H_2O_2.

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