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Research Article

DPPH FREE RADICAL SCAVENGING ACTIVITY OF AQUEOUS EXTRACT OF *Borassusflabellifer* TRICHOME

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ABSTRACT

Many medicinal plants contain large amount of antioxidants such as secondary metabolites, which play an important role in absorbing and neutralizing free radicals. In the present study *in vitro* free radical scavenging activity of aqueous extract of *Borassusflabellifer* trichome was carried out. The free radical scavenging efficacies of this extract was assessed by studying its ability to scavenge DPPH radicals. The aqueous extract of *Borassusflabellifer* trichome showed IC_{50} with minimum concentration and more effective in scavenging DPPH radical when compared to control ascorbic acid. Thus, the aqueous extract of *Borassusflabellifer* trichome could be recommended as a potent antioxidant to the patients suffering from various oxidative degenerative diseases such as diabetes, arthritis, cardiovascular diseases and cancer. This radical scavenging activity might be due to the active antioxidants present in the aqueous extract of *Borassusflabellifer* trichome.

INTRODUCTION

Free radicals are molecules with an unpaired electron due to which they are highly unstable, trying to capture electrons from nearby molecules and cause deterioration to cells. This chain reaction continues and causes damages to cell which includes damage to DNA, oxidations of polysaturated fatty acids in lipids, oxidations of amino acids in proteins, oxidative inactivate specific enzymes by oxidation of co radicals cause many human diseases like cancer, Alzheimer's disease, cardiac reperfusion abnormalities, kidney disease, and fibrosis. Antioxidants combat the free radicals formed and terminate the chain reaction before vital organs are damage. Synthetic antioxidants BHA, BHT and PG are widely used because they are cost effective and cheaper than natural ones. Hence, there is a growing interest all over the world in using the medicinal plants as a source of antioxidants. Oxidative stress is the main cause for the chronic degenerative diseases. During oxidation, free radicals are formed which damage the cells. Antioxidative defence mechanism is necessary to diminish the action of free radicals. A great number of medicinal plants contain chemical compounds which exhibit antioxidant properties (Lavanya Krishnadhas *et al.,* 2017).

Borassusflabellifer L, belongs to family *Arecaceae*, commonly known as Palmyra palm is a native of tropical Africa but cultivated and naturalized throughout India. The different parts of the *Borassusflabellifer* are being used for medicinal properties. Male flowers are used for anti-inflammatory activity, the juice from flowering stalks used for diabetes. Other than these pharmacological uses the juice of the plant is used in preparation of health drinks and jellies. The leaves are used to make baskets, hats and many other useful items. The midrib of the leaves and the fibers from the stalks are used in making brushes and base of young leaf stalks is used for straining the Toddy and for making torches. *Borassusflabellifer* contains gums, albuminoids, fats and the fresh pulp is reportedly rich in vitamins A and C. The fresh sap is a good source of vitamin B-complex. Studies have indicated that diets rich in fruits and vegetables and those of selected natural antioxidants such as plant poly-phenols, vitamin C and flavonoids are correlated with reduced incidence of cardiovascular and chronic diseases and certain cancer (Saravanan *et al.,* 2012). So the present study focused on *in vitro*f ree radical scavenging activity of DPPH free radical

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scavenging activity of aqueous extract of *Borassusflabellifer* trichome.

MATERIALS AND METHODS

Collection of plant material

Borassusflabellifer trichomes were collected from the outskirts of Tirupattur, Vellore district, Tamilnadu. The collected trichomes were shade dried, finely powdered and used for further studies.

In vitro assessment of radical scavenging efficacy of aqueous extract of Borassusflabellifer trichome

DPPH radical scavenging assay

This was assayed as described by Elizabeth and Rao (1990). The reaction mixture prepared containing 50ml of Methanol. DPPH (Diphenyl-2-picryl hydrazyl radical)- 1mM 3 ml of 1mM DPPH in methanol was added to 100µl of plant extract with concentrations ranging from 20µl, 40µl, 60µl,80µl and 100µl. DPPH solution with methanol was used as a positive control (ascorbic acid) and methanol alone acted as a blank. When DPPH reacts with antioxidant in the sample and the color changed from deep purple to light yellow. This was measured calorimetrically at 518 nm. The percentage for scavenging activity was calculated by the following formula:

$$\text{Scavenging activity (\%)} = \frac{\text{A518 (control)-A518 (sample)}}{\text{A518 (control)}} \times 100$$

RESULTS AND DISCUSSION

The *in vitro* radical scavenging efficacies of aqueous extract of *Borassusflabellifer* trichomes were assessed by its ability to scavenge the DPPH radical. The Figure 1 illustrates the dose response curve of DPPH radical scavenging activity of aqueous extract of *Borassusflabellifer* trichome. The IC_{50} values of aqueous extract of *Borassusflabellifer* trichomes were found to be 29µg and control ascorbic acid 35µg respectively. It was observed that aqueous extract of *Borassusflabellifers* trichomes had higher activity for scavenging DPPH radical activity.

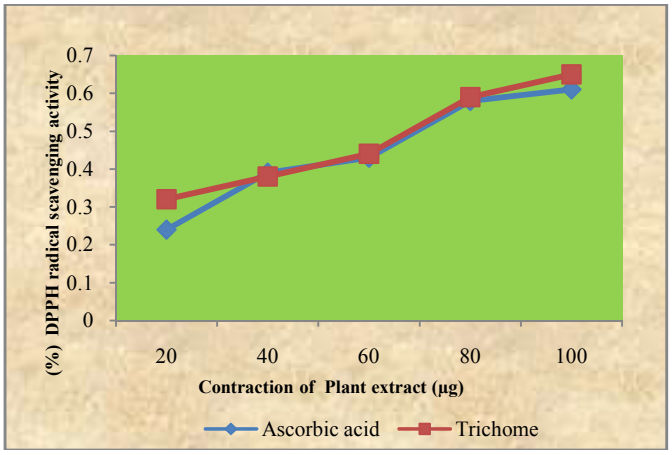

Figure 1 DPPH Scavenging Activity of aqueous extract of *Borassusflabellifer* trichome

The DPPH assay method is based on the reduction of DPPH, a stable free radical. The free radical DPPH with an odd electron gives a maximum absorption at 518 nm (purple colour). As the odd electron of the radical becomes paired off in the presence of a hydrogen donor, the absorption strength is decreased and results in decolourisation (yellow colour) with respect to the number of electron captured. More the decolourisation, more is the reducing ability. Free radicals and their scavenging systems play important role in the healing of normal and delayed types of wounds. The dose response curve of DPPH radical scavenging activity of the extract and standards showed that at the highest concentration (0.5mg ml^{-1}) the scavenging effect of the methanolic extract reached 9.3% (Afolayan *et al* ., 2018). Shyur *et al.* (2015) also reported that the scavenging activity for free radicals of 1,1-diphyryl-2-picrylhydrazyl (DPPH) has been widely used to evaluate the antioxidant activity of natural products from plants. The antioxidant activities of the leafy vegetables of India were measured in different systems of DPPH assay and IC_{50} values were calculated (Dasgupta and De 2017).

CONCLUSION

The present study revealed that the aqueous extract of *Borassusflabellifer* trichome possess antioxidant properties and could serve as free radical inhibitors or scavengers and act as primary antioxidants. With this kind of investigation it would be easier to treat and prevent the damages occurring due to the free radicals. Therefore, further research is needed for the isolation and identification of the active components in the extract.

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