October-December 2005 Volume 1 Issue 1-2

Trade Science Inc.

Natural Products

An Indian Journal

Full Paper

NPAIJ, 1(1-2), 2005 [14-16]

Free Radical Scavenging Potential Of *Cassia Auriculata* Root

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Received: 28th November, 2005
Accepted: 11th January, 2006

Web Publication Date : 21st January, 2006

ABSTRACT

The ethanol extract of the roots of *Cassia auriculata* has been investigated for their ability to scavenge 1,1, diphenyl picryl hydrazyl (DPPH) and lipid peroxidation in rat liver homogenate. The extract has been found to possess antioxidant activity in both the models tested as evident by IC_{50} values being 79.45 and 709.22μg/ml for scavenging of DPPH and lipid peroxidation respectively.

KEYWORDS

Cassia auriculata;
DPPH;
Lipid peroxidation.

INTRODUCTION

Cassia auriculata is a shrub with large bright yellow flowers found growing wild in central and western India and cultivated in other areas of the country. The tribal peoples of the Chittor district of Andhra Pradesh use this plant for the treatment of skin diseases, asthma, conjunctivitis and in renal disorders[1]. A survey of the literature revealed that the roots of *Cassia auriculata* are reported to contain flavonoids, polysaccharides, tannins, and saponins[2,3], which may contribute to its diverse uses in folklore medicine. The present study is an attempt to screen the antioxidant activity of ethanol extract of roots of *Cassia auriculata* by DPPH and lipid peroxidation assay.

MATERIALS AND METHODS

Plant material and extraction

The roots of the plant *Cassia auriculata* were collected from Agricultural University, Bangalore, India in the month of May 2003. Dr. T.N. Shivananda, Senior scientist, IIHR, Bangalore, confirmed the botanical identity of the sample. A voucher specimen (No. PESCP-054) has been deposited in the

Department of Pharmacognosy, PES College of Pharmacy, Bangalore, India. The roots were dried and powdered. Further 500 g of root powder was extracted by soxhlet apparatus (5 h) with 90% ethanol. The total ethanol extract was concentrated in vaccum to a syrupy consistency (yield 155 g)[4].

Preparation of the standards

For *in vitro* experiments, a weighed quantity of the extract was dissolved in a mixture of DMSO (dimethylsulphoxide), methanol and chloroform (3:1:1). The solution was serially diluted with respectively solvents to get lower dilutions. Ascorbic acid was used as reference standard for these studies and was prepared with distilled DMSO.

IN VITRO ASSAYS

DPPH Method

The antioxidant activity of the ethanol extract of *Cassia auriculata* was assessed on the basis of the radical scavenging effect of the stable DPPH free radical. Various dilutions of ethanol root extract of *Cassia auriculata* were diluted to 200 µl of DPPH in methanol solution (100 µM) in a 96-well microtitre plate (Tarsons Product (P) Ltd., Kolkota, India). After incubation at 37^{0}C for 30 min, the absorbance of each solution was determined at 516 nm using ELISA micro plate reader (Bio Rad Laboratories Inc., California, USA, Model 550). The corresponding blank readings were also taken and the remaining DPPH was calculated[5]. Similarly standard (ascorbic acid) solution reading was also taken. The values were expressed in terms of $IC_{50.}$ IC_{50} value is the concentration of the sample required to scavenge 50% DPPH free radical.

LIPID PEROXIDATION INHIBITION

The degree of lipid peroxidation was assayed by estimating the thiobarbituric acid-reactive substances (TBARS) by using the standard method[6] with minor modifications[7]. The values of TBARS were calculated from a standard curve absorption against concentration of tetraethoxy propane) and expressed as nmol/mg of protein. The percentage inhibition of lipid peroxidation was calculated by comparing the results of the test with those of controls not treated with the extract.

RESULTS AND DISCUSSION

In the present study the ethanol root extract of *Cassia auriculata* root was tested for antioxidant activity using DPPH and lipid peroxidation models. The DPPH method showed strong antioxidant nature of the ethanol extract of *Cassia auriculata*. The IC_{50} values observed were found to be comparable to that of standard ascorbic acid. The results clearly indicate that the ethanol extract was found to be more effective in scavenging the DPPH free radical.

The ethanol extract of *Cassia auriculata* tested for antioxidant activity using DPPH method showed the maximum antioxidant activity with IC_{50} values of 79.45 µg/ml in comparison with the standard ascorbic acid value of 87.8 µg/ml. The extract has moderate lipid peroxidation scavenging activity (IC_{50} being 709.22 µg/ml) by affording protection against the lipid peroxidation in rat liver homogenate. The results are summarized in TABLE 1.

The results obtained suggest that *Cassia auriculata* possesses antioxidant and free radical scavenging activity suggesting that ethnopharmacological approach in selecting the plant for study may be useful.

TABLE 1: Free radical scavenging activity of *Cassia auriculata*

Free radical method	IC_{50} value of sample (µg/ml)	Inhibition % of standard	
		Ascorbic acid (100 µM)	Tocopherol (µM)
DPPH	79.45	87.8	--------
Inhibition of lipid peroxidation	709.22	-------	89.3

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ACKNOWLEDGMENTS

Authors are thankful to Prof.M.R.Doreswamy, Founder and Prof.D.Jawahar, Director, PES group of Institution, Bangalore for their constant encouragement.

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