Academic Sciences

International Journal of Current Pharmaceutical Research

ISSN- 0975-7066 Vol 4, Issue 3, 2012

Research Article

IN VITRO RADICAL SCAVENGING ACTIVITY OF DIFFERENT EXTRACTS OF BUTEA MONOSPERMA LEAVES

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Received: 08 May 2012, Revised and Accepted: 11 June 2012

ABSTRACT

Free radical scavenging activity of leaves of *Butea monosperma* was evaluated by *in vitro* methods like radical scavenging activity by DPPH reduction. In the present study, different extracts of leaves of *Butea monosperma*, viz, methanol extracts with there fraction like pet ether fraction, chloroform fraction, ethyl acetate fraction, n-butanol fraction, methanol fraction were analyzed for antioxidant efficiency. It was observed that chlorform fraction has the potent antiradical activity than other fraction. The results were significant when compared with that of standards.

Keywords: *In Vitro* radical scavenging, *Butea Monosperma* leaves.

INTRODUCTION

Butea monosperma (Lam.) Taub., commonly called the flame of the forest, is considered as one of the most beautiful trees of India due to its gorgeous canopy of scarlet flowers which looks like a flame[1]. Butea monosperma is also known as Palash. It belongs to the family Fabaceae[2]. It is a well known traditionally used medicinal plant reported to possess antidiabetic, anti-inflammatory, antihelmintic, antimicrobial and antidiarrhoeal properties [3,4,5,6].

Reactive oxygen species are highly reactive compounds with a short half-life. ROS are generated continuously in the body by both endogenous and exogenous factors. When generation of ROS overtakes the antioxidant defense of the cells, the free radicals start attacking the cell proteins, lipids and carbohydrates[7,8,9] and this lead to a number of physiological disorders. Oxidative stress has been linked to various disorders such as cancer, cataracts, diabetes mellitus, inflammation, renal failure, cardiovascular diseases, hepatitis, inflammation, neurodegenerative diseases and aging[10]. Antioxidants may offer resistance against oxidative stress by scavenging the free radicals, inhibiting lipid peroxidation. Recent studies showed that a number of plant products including polyphenolic substances and various plant extracts exert potent antioxidant actions[11,12].

MATERIALS AND METHODS

Plant material

Leaves of *Butea monosperma* Lam. were collected from Junner (Pune), Mharsatra, India.

Preparation of plant extract

The leaves of *Butea monosperma* was shade dried and then powdered in a mechanical grinder. The powdered material was extracted with different solvents such as methanol, ethanol, pet ether, chloroform, ethyl acetate, n-butanol and H2O. The extracts were filtered and concentrated under reduced pressure.

DPPH radical scavenging activity

The DPPH radical scavenging activity of different extracts were measured in terms of hydrogen donating or radical scavenging ability using a stable radical DPPH (1, 1-diphenyl-2-picrylhydrazyl)[13]. Different concentrations of each extracts and standard were taken in different vials. 3 ml of DPPH solution (2mg/ml) were rapidly mixed with plant extracts. The absorbance was read at 517 nm. Ascorbic acid was used as reference standard. The radical scavenging activity was expressed as percent inhibition and was calculated using the following formula.

$$\% \text{ Inhibition} = [(A \text{ control} - A \text{ test}) / A \text{ control}] \times 100$$

Table 1: Antioxidant Activity of Total Extracts and Fractions of TM Extract of Leaves.

Extract	IC_{50} in µg	r^2
Total methanol extract	25	0.9926
Total Water extract	40	0.9839
Pet Ether fraction	1777.78	0.9826
Chloroform fraction	53	0.9948
Ethyl acetate fraction	80	0.9930
n-butanol fraction	156	0.9914
Methanol fraction	85	0.9895
Water fraction	200	0.9924
Ascorbic acid	2.99	0.9991

Table 2: % Inhibition of TM Extract and Ethyl Acetate Fraction of TM Extract of Leaves

Extract	Concentration µg / ml	% Inhibition	r^2	IC_{50} in µg
TM extract	5	27.12	0.992	25
	10	33.23		
	20	49.18		
	40	50.23		
	60	61.05		
	80	70.65		
Chloroform fraction	10	24.25	0.991	53
	20	33.49		
	40	42.97		
	60	57.51		
	100	76.8		
Ascorbic acid	1	31.36	0.9914	2.99
	2	39.92		
	3	50.18		
	4	58.37		
	5	65.63		
	10	98.54		

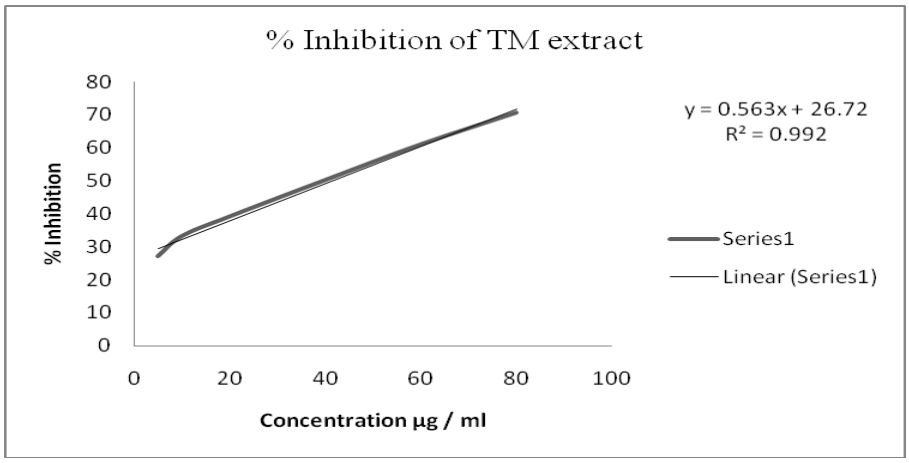

Fig. 1: Antioxidant Activity of Total Methanolic Extract Of Leaves

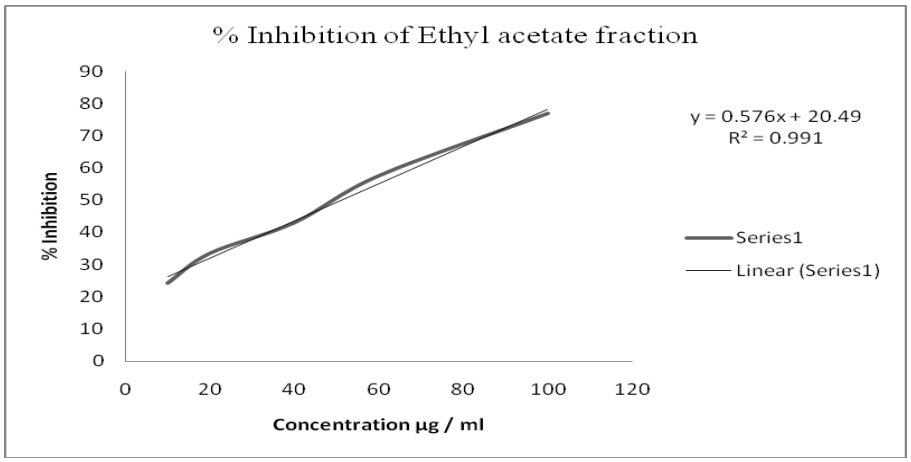

Fig. 2: Antioxidant Activity of Ethyl acetate fraction of Total Methanolic Extract Of Leaves

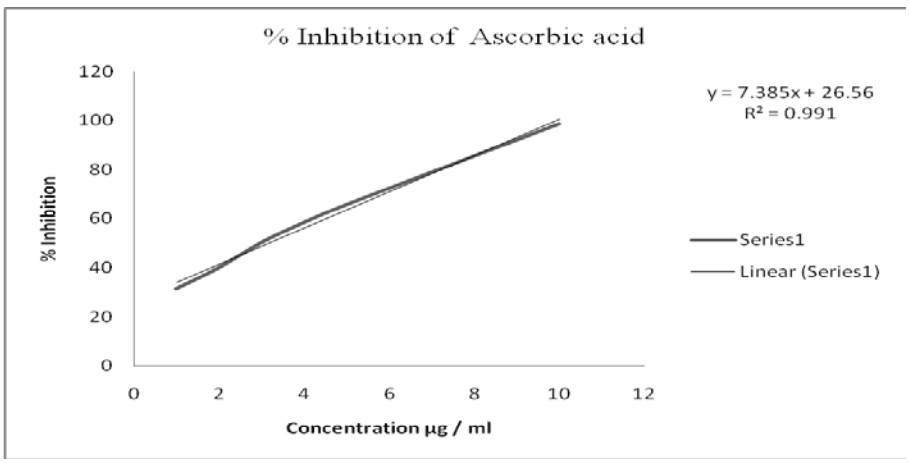

Fig. 3: Antioxidant Activity of Ascorbic Acid

RESULT AND DISCUSSION

Total methanolic (IC_{50} value is 25 µg) and aqueous extract (IC_{50} value is 40 µg) of leaves of *Butea monsparma* showed promising free radical scavenging activity by DPPH method as compared the positive standard, ascorbic acid (IC_{50} value is 2.99 µg)

The total methanolic extract possessed higher free radical scavenging activity than the aqueous extract. Thus Total methanolic extract was taken up for further fractionation to isolate the bio-active constituents.

The chloroform successive fraction (IC_{50} value is 53 µg) of TM extract of leaves exhibited maximum antioxidant potential followed by ethyl acetate fraction (IC_{50} value is 80 µg), methanolic fraction (IC_{50} value is 85 µg), n - butanol fraction (IC_{50} value is 156 µg), water fraction (IC_{50} value is 200 µg) and pet – ether fraction (IC_{50} value is 1777.78 µg) of total methanolic extract of leaves.

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