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In vitro evaluation of *Butea monosperma* Lam. for antioxidant activity

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ABSTRACT

This research was taken to investigate the antioxidant activity of leaves of *Butea monosperma*. The *in vitro* antioxidant activity of petroleum ether and chloroform extract of leaves of *Butea monosperma* was investigated by nitric oxide scavenging method. The chloroform extract showed good antioxidant activity in the above method. This activity may be due to presence of flavonoids.

Key words: Antioxidant activity, *Butea monosperma*, Free radicals, Nitric oxide.

INTRODUCTION

By virtue of specific metabolic processes or by accident of chemistry, the free radicals and oxygen derivatives are constantly generated in vivo. The generated free radicals may cause severe damage to biological tissue or molecules like DNA, lipids and proteins or may cause inflammation. The outcome of free radical reaction are also the diseases like lung diseases, nephrotoxicity, diabetes etc. The scavenging of free radicals, which minimize the generation of free radical, is an antioxidant defense system, which may be counteracted by either endogenous or exogenous antioxidants. The sufficient intake of antioxidants in our diet also proves to be effective to combat three-said diseases[1].

Butea monosperma, Lam is a tree that grows up to1-2 Meters in height[2]. It occurs throughout Indian subcontinent. Previous phytochemical investigation on this plant has shown the presence of flavonoids [3] and terpenoids[4]. The present study was carried out to screen antioxidant activity of the leaves of Butea Monosperma.

MATERIAL AND METHODS

The plant of Butea Monosperma was collected from Arvind Herbal lab, Rajapalayam, Tamilnadu, in the month of July and identification at Department of Botany by Dr. Stefen, The American college of Madurai (T. N.). Plant leaves were selected for assessment of activity. The dried leaves (dried under the shade) were extracted with 95% ethanol for 48 hours after deffatting with petroleum ether (for 75 hours) as hot continuous extraction by Soxhlet Apparatus. The extract was filtered and concentrated in vacuum under reduced pressure and dried in desiccator.

Evaluation of free radical scavenging activity

The antioxidant activity of Petroleum ether and chloroform extract of leaves of *Butea monosperma* was studied. The extract was studied with different concentration from 0.015-mg/ml to1

mg/ml. In vitro method {1,1-Diphenyl-2-picrylhydrazyl,(DPPH) scavenging and nitric oxide scavenging} was used to screen the plant for antioxidant activity. Ascorbic acid was used as positive control in the same concentration for DPPH scavenging and nitric oxide scavenging[5].

Scavenging of nitric oxide [6, 7]

The petroleum ether and chloroform extract was dissolved in (PBS)in different concentration and sodium Nitopruside was added (5ìm) in each tube and tubes were incubated at 25^0 C for 5 hours. Control experiment without test compound was carried out with identical condition. After 5 hours, 0.5 ml of incubation solution was removed and diluted with 0.5 ml of Griess reagent[8]. The absorbance was repeated for three times.

DPPH radical scavenging method[9, 10]

A stock solution of 0.1 ml of DPPH was prepared in ethanol, this solution was mixed with equal volume of solution (different concentration) of test compound in petroleum ether and chloroform. The reaction was allowed to complete in the dark for about 20 minutes. The absorbance was taken at 517 nm[11]. Experiment was repeated three times. The difference in absorbance between the test and the control was calculated and expressed as percentage scavenging of DPPH radical Table 1.

RESULTS AND DISCUSSION

From the study it is evidence that the petroleum ether and chloroform extract of leaves of Butea Monosperma, Lam has promising antioxidant activity against Nitric oxide and DPPH induced free radicals (Table 1). Reactive oxygen species (ROS) are formed continuously in cell as consequences of both oxidative biochemical reaction and external factors. However they become harmful when they are produced in excess under certain abnormal condition such as inflammation, ischemia and in presence of iron ions.

Table 1: Free radical scavenging activity of leaf of *Butea monosperma*

Concentration (mg/ml)	% Inhibition					
	DPPH scavenging			Nitric oxide scavenging		
	Ascorbic Acid	Petroleum ether extract	Chloroform extract	Ascorbic acid	Petroleum ether extract	Chloroform extract
1.0	83.81	63.71	65.58	85.89	62.81	63.28
0.50	79.73	58.72	59.83	78.25	75.28	68.02
0.25	74.68	53.12	52.82	72.28	71.98	66.03
0.125	52.12	45.10	48.72	54.22	52.29	51.02
0.05	40.05	30.12	32.42	42.26	40.12	39.0
0.025	30.25	15.01	20.12	32.12	30.08	20.12
0.015	20.10	08.03	10.08	15.18	08.03	06.04

Under these conditions the endogenous antioxidant may be unable to counter ROS formation[12, 13] reactive oxygen species formed may cause cellular damage and this damage may involve in etiology of diverse human disease. Exogenous antioxidant supplement is helpful to overcome this severe problem of free radicals, which can scavenge their free radicals.

The free radicals scavenging activity of natural compounds can be evaluated through their ability to quench the synthetic nitric oxide and DPPH free radicals, in which absorbance of reaction mixture is taken in visible range to know whether the compound is having antioxidant property.

From the study it was concluded that the petroleum ether and chloroform extract of leaves

of *Butea monosperma* is antioxidant in nature and can be used in various forms as antioxidant. It can also be concluded that this antioxidant activity of the drug could be attributed to flavanoids, which are present in *Butea monosperma* Lam.

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