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In–Vitro Evaluation Of *Callistemon Lanceolatus* For Antioxidant Activity

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ABSTRACT

This research was taken up to investigate the antioxidant activity of leaves of *Callistemon lanceolatus*. The *in vitro* antioxidant activity of alcoholic extract of leaves of *Callistemon lanceolatus* was investigated by DPPH free radical scavenging, nitric oxide scavenging methods. The ethanolic extract showed good antioxidant activity in these above methods. This activity may be due to the presence of flavanoids.

KEYWORDS

Callistemon lanceolatus;
Antioxidant activity;
DPPH scavenging methods;
Nitric oxide scavenging methods.

INTRODUCTION

Free radicals and oxygen derivatives are constantly generated in vivo both by accident of chemistry and specific metabolic purposes. The reactivity of free radicals vary with many causing inflammation or even severe damage to biological molecules, especially to DNA, Lipids and Proteins. Antioxidant defense system scavenges and minimizes free radicals formation[1].

Today we find a renewed interest in traditional medicines. Modern medicines have little to offer for alleviation of hepatic ailments whereas most important representative are of phytoconstituents. *Callistemon lanceolatus* Sm. (Myrtaceae) is an ornamental tree commonly known as bottlebrush owing to its flower shape[2]. Extracts of the leaves, flowers and fruits contains 1,8-cineoleand α-terpineole, methylatedflavones respectively. The leaves contain volatile oil, reported to possess fungicidal and insecticidal activities[3]. The present study was carried out to screen antioxidant activity of the leaves of

Note

Callistemon lanceolatus.

EXPERIMENTAL

Materials and methods

The leaves of *Callistemon lanceolatus* collected from medicinal plant material supplier and after collection, authenticated by taxonomist, K.N.K. Agriculture College and Research Center, Mandsaur (M.P.), India. The entire chemical procured from Sigma-Aldrich GmbH, Germany. Plant leaves were selected for assessment of the activity. The dried leaves (dried under the shade) were extracted with ethanol for 48 hours after defatting with petroleum ether (for 72 hours). The extracts were filtered and concentrated in vacuum under reduced pressure and dried in desicator.

Evaluation of free radical scavenging activity

The alcoholic extract of leaves of *Callistemon lanceolatus* was studied with different concentration from 0.015mg/ml to 1 mg/ml. *In vitro* methods (DPPH scavenging and nitric oxide scavenging) were used to screen the plant for the antioxidant activity.

Scavenging of nitric oxide

The ethanolic extract was dissolved in PBS in different concentration and sodium nitroprussdide was added (5 μM) in each tube and tubes were incubated at 25^{0}C for 5hr. Control experiments without test compound were carried out with identical conditions. After 5hr, 0.5 ml of incubation solution was removed and diluted with 0.5ml of Griess reagent. The absorbance was taken at 546 nm by using UV/visible spectrophotometer. Experiment was repeated for three times[4].

DPPH radical scavenging methods

A stock solution of 0.1 ml of DPPH was prepared in ethanol. This solution was mixed with equal volume of solutions (different concentrations) of test compound in ethanol. The reaction was allowed to complete in the dark for about 20 minutes. The absorbance was taken at 517 nm. Experiment was repeated three times. The difference in absorbances between the test and the control was calculated and expressed as percentage scavenging of DPPH radical[5] (TABLE 1).

TABLE 1: Free radical scavenging activity of the leaf of *Callistemon lanceolatus*

Concentration (mg/ml)	% Inhibition	
	DPPH scavenging	Nitric oxide scavenging
1.0	86.2	81.06
0.50	73.01	65.98
0.25	51.26	54.19
0.125	35.25	29.28
0.05	19.56	19.58
0.025	11.94	11.26
0.015	3.06	2.19

RESULTS AND DISCUSSION

From the study it is evident that the alcoholic extract of leaves of *Callistemon lanceolatus* has promising antioxidant activity against nitric oxide and DPPH induced free radicals (TABLE 1).

Reactive oxygen species (ROS) are formed continuously in cells as consequence of both oxidative biochemical reactions and external factors. However, they become harmful when they are produced in excess under certain abnormal conditions such as inflammation, ischemia and in the presence of iron ions. Under these conditions, the endogenous antioxidants may be unable to counter ROS formation[6,7]. Reactive oxygen species formed may cause cellular damage and this damage may involve in etiology of diverse human diseases. Exogenous antioxidant supplement is helpful to overcome this severe problem of free radicals, which can scavenge these free radicals.

The free radical scavenging activity of natural compounds can evaluates 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.

CONCLUSION

From the study it was concluded that the alco-

Note

holic extract of leaves of *Callistemon lanceolatus* is antioxidant in nature and can be used in various form as antioxidant. It can also be concluded that this antioxidant activity of the drug could be attributed to flavanoids, which are present in *Callistemon lanceolatus*.

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