Antioxidant in Vitro Scavenging Potential of Medicinal Plant- Embelia Basal

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Abstract

Embelia basal, belonging to family Myrsinaceae, is a well known medicinal plant as mentioned in Ayurvedic system of medicine. Medicinal plants are a source for a wide variety of natural antioxidant. Antioxidant activity is essential for many biological functions. Literature survey revealed that there are no reports on radical scavenging activity of the leaves of E. basal. The present work was carried out in order to evaluate the efficacy of E. basal, in view of free radical scavenging activity using acetone, ethanol, and methanol extracts.

Plant material was screened for their antioxidant activity by employing radical scavenging assay; DPPH (2, 2- Diphenyl -1- picrylhydrazyl). The percentage radical activity for the assay was determined using ascorbic acid as a standard. From the standard curves, inhibition concentrations in the test samples were calculated. It can be seen that the DPPH radical scavenging activity for ethanol extract is found to be more significant than methanol and acetone extracts.

The findings of the present study suggest that E. basal could be a potential source of natural antioxidant that could have great importance as therapeutic agents in preventing or slowing the progress of aging and age associated oxidative stress related degenerative diseases.

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INTRODUCTION

Medicinal plants are a source for a wide variety of natural antioxidant. Antioxidant activity is an essential for many biological functions. Increased consumption of dietary antioxidants or fruits and vegetables with antioxidant properties may contribute to the improvement in quality of life by delaying onset and reducing the risk of degenerative diseases associated with aging1. Reactive Oxygen Species (ROS) such as singlet oxygen, superoxide anion (O^{2-}) and hydroxyl radical (OH^{-}) are often generated as byproducts of metabolic process in living organisms[2].

The present work was carried out in order to evaluate the efficacy of the plant in view of antioxidant contents. Air shade dried and pulverized plant material was extracted at room temperature for twenty four hours with acetone, ethanol and methanol. It was screened for their antioxidant activity by employing radical scavenging assay; DPPH (2, 2-

Diphenyl -1- picrylhydrazyl). The percentage radical activity for the assay was determined using ascorbic acid as a standard. From the standard curves, their concentrations in the test samples were calculated.

EXPERIMENTAL

Preparation of Extracts

Air shade dried and powdered material (10 gm) was extracted with the Acetone, Ethanol and Methanol by keeping for twenty four hours at room temperature. Solvent was recovered under reduced pressure to obtain crude extracts. Oxidation potential of the extracts was determined by DPPH scavenging activity. Folin-Ciocalteau reagent, Catechol, Quercetin, Ascorbic acid and all other chemicals used were from Merck. The UV spectrophotometer (UV-VisS1700 Pharma Spectrometer Schimadzu) was employed for the measurement of absorbance at various concentrations of the extracts under study.

In Vitro DPPH Scavenging Activity

DPPH (2, 2-Diphenyl -1- picrylhydrazyl, 4.3mg) was dissolved in methanol (6.6 ml); it was protected from light by covering the test tubes with aluminum foil. DPPH solution (150 µl) was added to 3ml methanol and absorbance was noticed immediately at 516 nm for control reading. A different volume of test samples that was (50 - 350 µl) was applyed. Each of the sample was diluted with methanol up to 3ml and to it 150 µl DPPH was added. Absorbance was observed after 15 minutes at 516 nm using methanol as blank. IC50 values for the samples were calculated and compared with Ascorbic acid as a positive control. The % reduction and IC50 values were calculated. The free radical scavenging activity (% antiradical activity) was calculated using the equation:

% Antiradical Activity = Control Abs. - Sample Abs. × 100

/ Control Absorbance

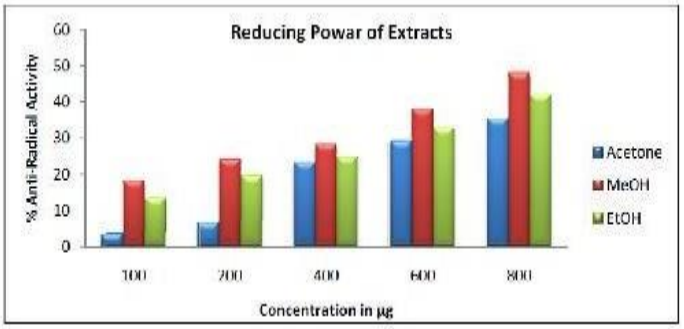
Each experiment was carried out in triplicates and results were recorded as mean % antiradical activity ± SD.

RESULTS AND DISCUSSION

DPPH is a stable free radical that can accept an electron or hydrogen radical to become a stable diamagnetic molecule. Due to its odd electron, the methanolic solution of DPPH shows a strong absorption band at 517nm; reduction of the DPPH radicals can be observed by the decrease in absorbance at 517nm. DPPH radicals react with suitable reducing agents and then electrons become paired off and the solution loses colour stoichometrically with the number of electrons taken up. DPPH Radical Scavenging Activity for extracts depicted. IC50 values for different extracts with ascorbic acid as a positive control are recorded. It can be seen that the DPPH radical scavenging activity for ethanol extract is found to be more significant than methanol and acetone extract, **(ethanol > methanol > acetone)**.

Table 1: DPPH Scavenging Activity of Extracts

Extracts	IC_{50} Concentration(µg)
Ascorbic Acid	3.028
Acetone	42.62
Ethanol	9.87
Methanol	33.35



This study indicates that the ethanol extract obtained from the medicinally important plant- *E. basal* exhibited the significant antioxidant activity. The high scavenging activity is due to hydroxyl groups of phenolic compounds and chemical structure that can provide the necessary component as a radicalscavenger.

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