



DPPH RADICAL SCAVENGING ACTIVITY A NEW TRITERPENE DERIVATIVE ISOLATED FROM ROOT BARK OF *ZIZIPHUS NUMMULARIA* AUBREV

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ABSTRACT

The study was designed with an aim to investigate the DPPH radical scavenging activity of the ethanolic extract (EE) and an identified lead compound (LC) which is a new triterpene derivative isolated from root bark of *Ziziphus nummularia*. The *in vitro* evaluation of antioxidant activities of ethanolic extract (EE) and an identified lead compound (LC) was done by measuring DPPH radical. The results indicate that EE and LC of *Z. nummularia* have potent DPPH radical scavenging activity.

KEYWORDS: *Ziziphus nummularia*, *in vitro*, DPPH

INTRODUCTION

The excessive production of free radicals is responsible for oxidative stress which is grossly implicated in the pathogenesis of various diseases such as cancer, diabetes, cardiovascular diseases, aging and metabolic syndrome^{1,2}. These radicals can be scavenged by the protective role of natural and synthetic antioxidant agents. Recently, there has been a worldwide trend towards the use and ingestion of natural antioxidants present in different parts of plants due to their phytochemical constituents^{3,4}.

Ziziphus nummularia (*Z. nummularia*) Aubrev (Rhamnaceae) is one of the most commonly occurring branched thorny shrub species in the sandy soil. The various parts of the plant have different medicinal activity because of presence of different phytoconstituent⁵. We have reported the presence of a new triterpene derivative containing three basic rings of steroidal moiety and two diketone groups which are reported for the first time and the study concluded that anticancer activity of the compound may be inhibiting free radicals due to donation of the active hydrogen. Considering the above findings the present study was designed to investigate the DPPH radical scavenging activity of the ethanolic extract (EE) and an identified lead compound (LC).

MATERIALS AND METHODS

Plant material & Reagent

Root bark of *Ziziphus nummularia* were collected in September 2010 from Durgapur, India and authenticated by the Taxonomists of Botanical Survey of India [Ref. CNH/I-1/20/2010/Tech.II/171]. A voucher specimen (BCRCP/DP/

PT/02/06) has been deposited at our laboratory for future reference. All the reagents used in the assay are of AR grade.

Assay of DPPH radical scavenging activity

The DPPH radical scavenging activity was assayed according to the method of⁶ with some modifications. Briefly, 2 ml of DPPH solution (0.2 mM DPPH in methanol) was mixed with 2 ml of EE and LC (0.05–2 mg/mL). The mixture was shaken vigorously and allowed to stand at room temperature for 30 min. Then, the absorbance of the mixture was measured at 517 nm. PCG was used as the positive control. The DPPH radical scavenging activity was calculated by the following formula:

$$\text{Scavenging activity (\%)} = [1 - (A_1 - A_2) / A_0] \times 100$$

where A_0 is the absorbance of the control (ethanol instead of sample), A_1 is the absorbance of the sample, and A_2 is the absorbance of the sample only (methanol instead of DPPH). The IC_{50} values were calculated by probit analysis.

RESULTS & DISCUSSION

As shown in Figure 1, the scavenging activities on DPPH radical of EE, LC and PCG increased with the increase of concentrations. At the concentration of 2 mg/mL, the DPPH scavenging activity for EE, LC and PCG was 80.13%, 88.45% and 96.13%, respectively. It should be noted that the scavenging activity of PCG was higher than ethanolic extract and LC ($p < 0.05$). The IC_{50} values for EE, LC and PCG were 125.89, 50.12 and 5.62 $\mu\text{g/mL}$, respectively. The results indicated that LC had higher DPPH radical scavenging capacity than EE of *Z. nummularia* but lower than PCG.

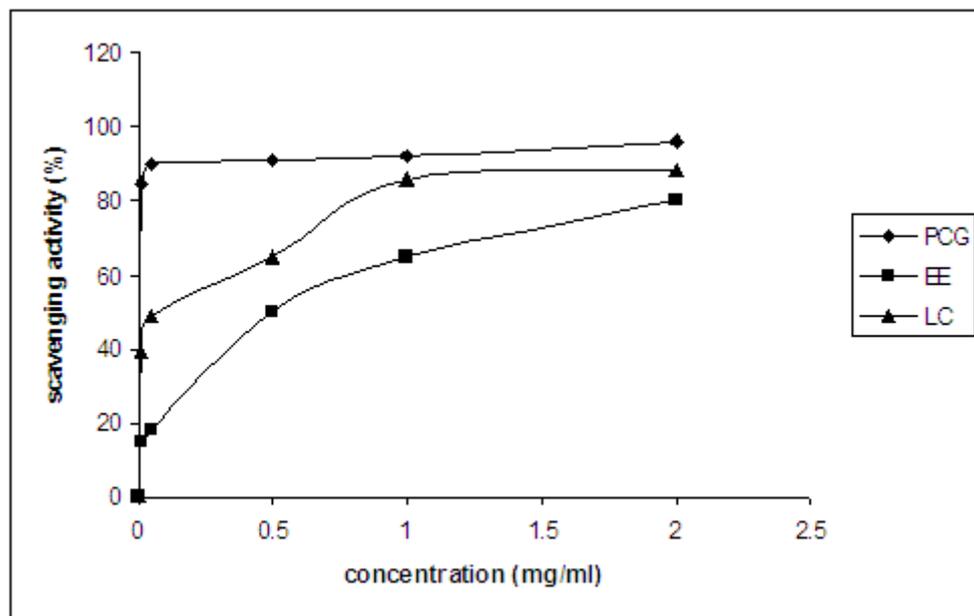


Figure 1: The scavenging activity on DPPH radical of ethanolic extract (EE), lead compound (LC) of *Z. nummularia* and PCG

The model of scavenging DPPH radical is a widely used method to evaluate the free radical scavenging activities of antioxidants. In the DPPH assay, the antioxidants are able to reduce the stable DPPH radical (purple) to the non-radical form DPPH (yellow). The DPPH scavenging activities of antioxidants are attributed to their hydrogen donating abilities.

CONCLUSION

The results indicate that EE and LC of *Z. nummularia* have potent antioxidant activity on inhibition of DPPH radical. However LC has better activity than EE.

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