SCIENCE WORLD JOURNAL OF PHARMACEUTICAL SCIENCES

Phytochemical Screening and *In Vitro* Anti-Oxidant Activity of *Elaeocarpus ganitrus*

M. Srikanth*
M. Mukesh
Suresh Gopal
M. Anusha
K. Ramanjaneyulu
J. Himabindhu

Department of Pharmaceutical Chemistry, Vishnu Institute of Pharmaceutical Education and Research, Telangana, India

Article Information

Article Type: Research Article
Journal Type: Open Access
Volume: 1
Issue: 1
Manuscript ID: SWJPS1-102
Publisher: Science World Publishing
Received Date: 06 August 2018
Accepted Date: 10 August 2018
Published Date: 14 August 2018

***Corresponding author:**

M Srikanth
Department of Pharmaceutical Chemistry
Vishnu Institute of Pharmaceutical Education and Research
Telangana, India

Citation: M. Srikanth et al., (2018) Phytochemical Screening and *In Vitro* Anti-Oxidant Activity of *Elaeocarpus ganitrus*. Sci World J Pharm Sci, 1(1);1-3

ABSTRACT

The present study aimed at evaluation of antioxidant activity of leaf extract of *Elaeocarpus ganitrus* by using *in vitro* assay. Extraction was carried out with methanol extract by using Soxhlet apparatus. The *in vitro* antioxidant activity methanol extract has been investigated by 1, 1-diphenyl, 2-picryl-hydrazyl free radical (DPPH), hydrogen peroxide (H_2O_2) method.. The methanol extract exhibited maximum antioxidant activity at 100 µg/ml concentration. The results have been compared with the standard ascorbic acid.

KEYWORDS

Antioxidant activity, Free radicals, Methanol extract

INTRODUCTION

Oxidation is one of the most important free radical-producing processes in food, chemicals and even in living systems. Free radicals play an important role in food and chemical material degradation, contributing also to more than one hundred disorders in humans. [1-6]. An antioxidant can be defined as: "any substance that, when present in low concentrations compared to that of an oxidisable substrate, significantly delays or inhibits the oxidation of that substrate [7]. A free radical can be defined as any molecular species capable of independent existence that contains an unpaired electron in an atomic orbital [8]. Plants are rich sources of natural antioxidants, the best known are tocopherols, carotenoids, vitamin C, flavonoids, and different other phenolic compounds [9]. Recently, among natural antioxidants,flavonoids have received increasing attention. As compared with vitamin C and E, dietary flavonoids are considered to be more powerful antioxidants [10].

The main characteristic of an antioxidant is its ability to trap free radicals. Antioxidant compounds like phenolic acids, polyphenols and flavonoids scavenge free radicals such as peroxide, hydroperoxide or lipid peroxyl and thus inhibit the oxidative mechanisms that lead to degenerative diseases [11]. Therefore, in the present study, the antioxidant activity of the leaf extract of *Eleaocarpus ganitrus* was evaluated.

Plant collection and authentication

The leaves of the plant *Elaeocarpus ganitrus* were collected in the month of November in Narsapur, Medak District, Telangana, India. The plant was authenticated by M. Malla Reddy (M.Sc, M.Phil in Botany), Retired lecturer in Botany, Vikarabad, Telangana.

Material used

In the present study 1,1 diphenyl, 2-picryl-hydrazyl free radical (DPPH), hydrogen peroxide (H_2O_2), used during investigation of antioxidant activity. All the material were used in laboratory grade.

Preparation of plant extract

The leaves of *E. ganitrus* were shade dried and crushed into powder and sieved to get a coarse powder. The powder was subjected to soxhletion using methanol for 72 h. The solvent was evaporated using rotary evaporator then the extract was used for the evaluation of antioxidant activity.

Preliminary phytochemical analysis

The methanol extract were screened for the phytochemical constituents using the standard method (Table 1).

Table 1: Phytochemical screening of methanolic extract of *Elaeocarpus ganitrus*

S. No.	Phytochemical	Methanol extract
1	Carbohydrates	+
2	Proteins	-
3	Alkaloids	+
4	Steroids	+
5	Flavonoids	+
6	Phenol	+
7	Tannins	+
8	Saponin	+
9	Glycosides	+
10	Terpenoids	+
11	Phlobatannin	-

+ Indicates present; - Indicates absent

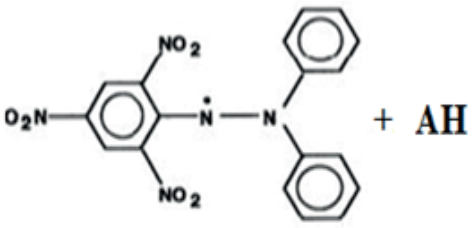
ANTIOXIDANT ACTIVITY

DPPH Scavenging activity

The molecule DPPH is characterized as a stable free radical by virtue of the delocalisation of the spare electron over the molecule as a whole, so that the molecule does not dimerize, as would be the case with most other free radicals. The delocalization of electron also gives rise to the deep violet color, characterized by an absorption band in ethanol solution centered at about 517 nm. When a solution of DPPH is mixed with that of a substrate (AH) that can donate a hydrogen atom, then this gives rise to the reduced form with the loss of this violet color.

Procedure

The free radical scavenging activity of all the samples was evaluated by DPPH according to the previously reported method by Shen et al., 2010. Briefly, a 0.1 mM solution of DPPH in ethanol was prepared and 1 ml of this solution was added to 3 ml of the solution of all samples in ethanol at different concentration (1, 2, 3, 4, 5 & 10 µg/ml). The mixtures were shaken vigorously and allowed to stand at room temperature for 30 min. Then the absorbance was measured at 517 nm using a UV-Visible spectrophotometer. Ascorbic acid was used as the reference. Lower absorbance values of reaction mixture indicate higher free radical scavenging activity. The capability of scavenging the DPPH radical was calculated by using the following formula.



Diphenylpicrylhydrazyl (Free radical)

DPPH scavenging effect (% inhibition) = {(A0 –A1)/A0)*100}

Where, A0 is the absorbance of the control reaction, A1 is the absorbance in presence of all of the extract samples and reference. All the tests were performed in triplicates and the results were averaged [12].

Determination of IC_{50}

The IC_{50} value (The concentration of sample required to scavenge 50% of DPPH free radicals) was determined by interpolation from the calibration curve plotted between percentage inhibition and sample concentration and expressed as µ/ml.

RESULTS AND DISCUSSION

Antiradical activity assay is based on the reduction of DPPH. Due to the presence of an odd electron it gives a strong absorption maximum at 517 nm. As this electron becomes paired off in the presence of a hydrogen donor, i.e. a free radical scavenging antioxidant, the absorption strength is decreased, and the resulting decolorization is stoichiometric with respect to the number of electrons captured. The decomposition of DPPH free radicals by *Elaeocarpus ganitrus* may at least partly result from its antioxidant and free radical scavenging activity.

Table 2: DPPH free radical scavenging activity

Concentration (µg/ml)	Standard percent scavenging (%)	Methanol extract percent scavenging (%)
20	91	95
40	92	96
60	94	97
80	96	98
100	97	99

CONCLUSION

The results obtained in the present study indicate that *Elaeocarpus ganitrus* methanolic extract exhibit significant free radical scavenging and antioxidant activity more than that of Standard compound Ascorbic Acid. The overall antioxidant activity might be attributed to its phytochemical constituents. The findings of the present study suggest that, this *Elaeocarpus ganitrus* could be a potential source of natural antioxidant that could have great importance as therapeutic agent in preventing or slowing the progress of aging and age associated oxidative stress related degenerative diseases.

ACKNOWLEDGEMENTS

The authors sincerely thankful to our chairman Shri. K.V. Vishnu Raju Garu and our College Vishnu Institute of Pharmaceutical Education and Research Principal Dr. Ramesh Alluri and staff members for towards our project.

BIBLIOGRAPHY

1. Ye Z, Song H, Antioxidant vitamins intake and the risk of coronary heart disease: Meta analysis of cohort studies, Eur J Cardiovasc Prev Rehabil, 2008:16;26-34.
2. Trible DL, Antioxidant consumption and risk of coronary heart disease: Emphasis on Vitamin C, vitamin E and ß-carotene: a statement for healthcare professionals from the American Heart Association, Circulation, 1999:99;591-595.
3. Jalil AMM, Ismail A, Polyphenols in cocoa and cocoa products: Is there a link between antioxidant properties and health?, Molecules, 2008:13;2190-2219.
4. Jipa S, Zaharescu T, Gorghiu LM, Dumitrescu C, Setnescu R, Kinetic aspects concerning the thermal oxidation of LDPE stabilized with vitamins, Rev Chim (Bucuresti), 2004:55;514-518.
5. Jipa S, Zaharescu T, Gigante B, Santos C, Setnescu R, Setnescu T,

Dumitru M, Gorghiu LM, Kappel W, Mihalcea I, Chemiluminescence investigation of thermo-oxidative degradation of polyethylenes stabilized with fullerenes, Polymer Degrad Stabil, 2003:80;209-216.

6. Gorghiu LM, Jipa S, Zaharescu T, Setnescu R, Mihalcea I, The effect of metals on thermal degradation of polyethylenes, Polymer Degrad Stabil, 2004:84;7-11.
7. Halliwell B, Gutteridge JC, The definition and measurement of antioxidants in biological systems, Free Radic Biol Med, 1995:18;125-126.
8. Halliwell B, Gutteridge JM, Free radicals in biology and medicine, 2nd Edi., Oxford: Clarendon Press, 1989.
9. Iqbal S, Bhanger M, Effect of season and production location on antioxidant activity of *Moringa oleifera* leaves grown in Pakistan, J Food Comp Anal, 2006:19;544-551
10. Sultana B, Anwar F, Flavonols (kaempeferol, quercetin, myricetin) contents of selected fruits, vegetables and medicinal plants, Food Chem, 2008:108;879-884.
11. Wu YY, Li W, Xu Y, Jin EH, Tu YY. Evaluation of the antioxidant effects of four main the a flavin derivatives through chemiluminescence and DNA damage analyses, J Zhejiang Univ Sci B, 2011:12;744-751.
12. Shen Q, Zhang B, Xu R, Wang Y, Ding X, Li P, Antioxidant activity *in vitro* of selenium-contained protein from the se-enriched, *Bifodobacterium animalis*, Anaerobe, 2010:16;380-386.