ANTIOXIDANT ACTIVITY OF *RUBIA CORDIFOLIA*

More Babita H[1]., Gadgoli Chhaya[2] and Pardesi Goldee S. [2]

Department of Pharmacognosy,

Saraswathi Vidya Bhavan's College Of Pharmacy,

Shil Road, Dombivli (East)

Corresponding Author: goldeepardesi@rediffmail.com

Summary

The Antioxidant activity of various successive extracts of the roots *Rubia cordifolia* (*Rubiaceae*) in various concentrations was estimated by two in vitro assays namely DPPH (1,1-Diphenyl,2- picryl-hydrazyl) scavenging activity and Ferric ion reduction method. The activity was expressed as the inhibitory concentration (IC50). The chloroform extract of *R. cordifolia* roots showed significant activity by both methods when compared with standard Ascorbic acid.

Keywords: Antioxidant**,** *Rubia cordifolia*

Introduction

Antioxidants are important for human health and nutrition. Antioxidant scavenges free radicals and thereby reduces the risk of various diseases. [1] Free radical is any active species oxidizes the surrounding molecule and set the chain reaction, thus destroying large number of cell component and therefore responsible for various diseases such as cancer, inflammation, diabetes, liver toxicity cardiovascular diseases. [2] Plant provides a rich source of antioxidants which include vitamin C, carotenoids, quinone and phenolic compound. [3]

From the Literature survey, it is evident that *R. cordifolia (Rubiaceae)* has been studied extensively for phytoconstituents and roots of *R. cordifolia* are well known source of anthraquinone.[4] Quinones being known to possess antioxidant activity, hence in the present study, an attempt is made to fractionate the drug into various solvents of increasing polarity followed by evaluation of antioxidant activity using invitro methods.

Methods

The dried roots were collected from local market and authenticated by comparing with the standard material at Agharkar Research Institute, Pune.

Preparation of Plant Extracts:

The dried roots of drug were oven-dried and then pulverized in to fine powder using pulveriser. The root powder was then exhaustively extracted with the solvents of increasing polarity viz. Pet-ether (60-80^{0}C), Chloroform, Acetone, Methanol and Distilled water using Soxhlet extractor and extracts were then concentrated under reduced pressure. The Total Aqueous extract was prepared by decoction method using distilled water as solvent. The extract was then concentrated under reduced pressure.

1. *DPPH Radical Scavenging Method:*[5]

7.9 mg% solution of DPPH was prepared using methanol and 2 ml of this solution was added to 2 ml of various concentrations of test solutions. The blank was prepared by replacing test solution with 2 ml methanol. Twenty minutes after incubation at room temperature absorbance was read against methanol as blank at 517 nm. The decrease in absorbance of DPPH is proportional to concentration of free radicals scavenger added to the DPPH reagent solution.

The activity was expressed as the inhibitory concentration (IC50) i.e. the concentration of the test solution required to decrease the absorbance to 50 % that of blank solution.

2. *Ferric ion reduction method using o-Phenanthroline Reagent:*[6]

A set of 8 test tubes were prepared by adding 1 ml of *o*- Phenanthroline (50mg%) solution, 1.8 ml of 1.63mg%ferric chloride solution, 2 ml of various concentration of test solutions, followed by 0.2 ml of methanol. In test tube labelled as standard, the extract was replaced by standard antioxidant solution viz. ascorbic acid solution (5.3 mg in 100 ml of distilled water). The test tubes were incubated for 10 minutes at room temperature and absorbance was recorded at 510 nm against methanol as blank.

Results and Conclusions

Table I shows the IC50 values of respective extracts by DPPH scavenging activity. Table II shows the IC50 values of respective extracts by Ferric ion reduction method.

IC50 value is the minimum concentration of extract required for the 50 % reduction of absorbance.

Table I: ***IC50 Values of Various Extract for Antioxidant activity by DPPH method:***

Extracts	**Mean IC 50 Value ± S.D.**
Pet ether	199.5 ± 2.40
Chloroform	142.1 ±1.31
Acetone	177.8 ± 0.96
Methanol	346.7 ± 1.25
Successive Aqueous	223.9 ± 4.47
Total Aqueous	151.4± 3.14

Table II: IC50 Values of Various Extract for Antioxidant activity by Ferric Ion reduction Method:

Extracts	**Mean IC 50 Value ± S.D.**
Pet ether	460 ± 2.05
Chloroform	110 ± 3.12
Acetone	245 ± 2.16
Methanol	430 ± 2.49
Successive Aqueous	290 ± 1.78
Total Aqueous	235 ± 1.97

In case of the extracts of *R. cordifolia,* the most potent antioxidant activity was observed in chloroform extract by DPPH method as the minimum concentration of 142.1 µg/ml required for the 50 % reduction of absorbance.

The activity was also evaluated by ferric ion reduction method and the identical result was obtained. The result showed that the chloroform extract has highest % inhibition and lowest IC50 value i.e.110 µg/ml.

The significant antioxidant activity of value above extract may be attributed due to the presence of quinones in the roots.

References

1) Kusum D.V. and Fazlu R., "Neutraceutical Antioxidants" An overview, Indian J. Pharm.Edu., 2002; 36(1): 2-8.
2) Gopinathan N., Shrinivasan K.K. and Mathew J.E., Free radical scavenging properties of the ethanol extract of *Saccharum spontaneum*, Indian Drugs, 2004; 41(10): 633-635.
3) Rashmi, Dayal R., and Subramaniam V., Invitro Antioxidant Activity Of Medicially Important *Achranthes aspera*- A preliminary Study., 2007; 44(2): 128-131.
4) Shrotri M. K., Gavhane R. C. and Munkandan U., Indian Drugs, 2005; 42**:** 20.
5) Blois M. S., Nature, 1958; 181: 1199.
6) Gopinathan N., Shriniwasan K. K. and Mathew J. E., Indian Drugs, 2004; 41(10): 633.