



## Evaluation of Antioxidant Activity of *Rosa indica* Linn

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### Abstract

Plants have served human beings as a natural source for treatments and therapies from ancient times, amongst them medicinal herbs have gain attention because of its wide use and less side effects. In the recent years plant research has increased throughout the world and a huge amount of evidences have been collected to show immense potential of medicinal plants used in various traditional systems. *Rosa indica* symbol of godness and beauty known for various healing power, has astringent, sedative, anti-inflammatory and antidepressant qualities. The aim of the present study was to evaluate *in vitro* antioxidant activities of leaves of *Rosa indica*. The *in vitro* antioxidant activity of methanolic extract of the leave part was assessed against DPPH free radical scavenging assay methods using standard protocols. The activities of methanolic leave part extract against DPPH assay method were concentration dependent with IC 50 values of ascorbic acid and extracts 24.34 and 62.66µg/ml respectively. The diverse array of phytochemicals present in the plant thus suggests its therapeutic potentials which may be explored in drug manufacturing industry as well as in traditional medicine.

**Keywords:** Antioxidant activity, *Rosa indica*, DPPH assay method, Methanolic extract

## INTRODUCTION

Indian medicinal plants are considered a vast source of several pharmacologically active principles and compounds, which are commonly used in home remedies against multiple ailments<sup>1</sup>. Reactive oxygen species (ROS) are highly reactive molecules which may be both important mediators of some physiological functions and also potential prooxidants. Imbalance between ROS generation and antioxidant capacity induces a condition known as oxidative stress which may play a major role in the initiation and progression of numerous pathologies including cardiovascular dysfunction associated with vascular disease, hyperlipidemia, diabetes mellitus, hypertension and ischemia/reperfusion injury. The potential damage caused by an excess of ROS is controlled by a series of antioxidant defence mechanisms and among them, a key protective role is played by the antioxidant enzymes glutathione (GSH) peroxidase, superoxide dismutase (SOD) and GSH reductase<sup>2</sup>. Several herbal secondary metabolites such as flavonoid have been found to protect cells from oxidative damage<sup>3</sup>. These compounds have been evidenced to stabilize RBC membrane by scavenging free radicals and reducing lipid peroxidation<sup>4,5</sup>. *Rosa indica* belongs to family Rosaceae is an erect or climbing shrubs, deciduous or evergreen and have a wide range of biological activities, multiple health issues like intestinal diseases, as inflammatory agents and as well as for: diarrhoea, constipation, gallstones, gallbladder ailments, lower urinary tract, kidney disorders, fluid retention (dropsy or oedema), gout, back and leg pain (sciatica), high cholesterol, weight loss, high blood pressure, fever, increasing immune function during exhaustion, increasing blood flow in the limbs increasing urine flow and quenching thirst<sup>6</sup>. The present study was focused to

evaluate the anti oxidant activity of leaves of *Rosa indica* by using DPPH free radical scavenging assay methods.

## MATERIALS AND METHODS

### Plant material

The leaves of plant *Rosa indica* were collected from local area of Bhopal (M.P), India. **Chemical reagents**

All the chemicals used in this study were obtained from Hi Media Laboratories Pvt. Ltd. (Mumbai, India), Sigma Aldrich Chemical Co. (Milwaukee, WI, USA), SD Fine-Chem. Ltd. (Mumbai, India) and SRL Pvt. Ltd. (Mumbai, India). All the chemicals used in this study were of analytical grade.

### Extraction of plant material

#### Cold maceration method

Leaves of *Rosa indica* were collected, washed and rinsed properly. They were dried in shade and powdered mechanically. About 200gm of the leaves powder was macerated with petroleum ether and methanol and stored for 72 hours in ice cold condition for the extraction of phytochemicals. At the end of the third day extract was filtered using whatman No. 1 filter paper to remove all un-extractable matter, including cellular materials and other constituents that are insoluble in the extraction solvent. The entire extract was concentrated to dryness using rotary flash evaporator under reduced pressure and stored in an air tight container free from any contamination until it was used. Finally the percentage yields were calculated of the dried extracts<sup>7</sup>.

### DPPH free radical scavenging assay

DPPH scavenging activity was measured by modified method<sup>8</sup>. DPPH scavenging activity was measured by the spectrophotometer. Stock solution (6 mg in 100ml methanol) was prepared such that 1.5 ml of it in 1.5 ml of methanol gave an initial absorbance. Decrease in the absorbance in presence of sample extract at different concentration (20-100µg/ml) was noted after 15 minutes. 1.5 ml of DPPH solution was taken and volume made till 3 ml with methanol, absorbance was taken immediately at 517 nm for control reading. 1.5 ml of DPPH and 1.5 ml of the test sample of different concentration were put in a series of volumetric flasks and final volume was adjusted to 3 ml with methanol. Three test samples were taken and each processed similarly. Finally the mean was taken. Absorbance at zero time was taken for each concentration. Final decrease in absorbance was noted of DPPH with the sample at different concentration after 15 minutes at 517 nm. The percentage inhibition of free radical DPPH was calculated from the following equation: %

inhibition =  $\frac{[(\text{absorbance of control} - \text{absorbance of sample}) / \text{absorbance of control}] \times 100\%}{}$ . Though the activity is expressed as 50% inhibitory concentration (IC<sub>50</sub>), IC<sub>50</sub> was calculated based on the percentage of DPPH radicals scavenged. The lower the IC<sub>50</sub> value, the higher is the antioxidant activity.

### RESULTS AND DISCUSSIONS

The crude extracts so obtained after cold maceration extraction process were concentrated on water bath by evaporation the solvents completely to obtain the actual yield of extraction. The percentage yield of extraction is very important in phytochemical extraction in order to evaluate the standard extraction efficiency for a particular plant, different parts of same plant or different solvents used. The yield of extracts obtained from the leaves of the plants using petroleum ether and methanol as solvents are depicted in the Table 1.

**Table 1: Results of percentage yield of leaves extracts**

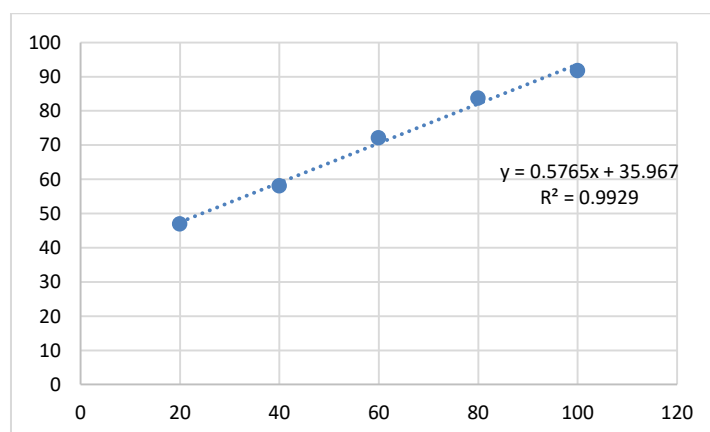
S. No.	Solvent	Colour of extract	Weight of plant material (gm)	Weight of extract (gm)	% yield
1.	Petroleum ether	Dark green	100.21	0.425	0.424
2.	Methanol	Dark green	96.17	4.08	4.24

Antioxidant activity of the samples was calculated through DPPH assay. % inhibition was calculated as an indicative of antioxidant potency. The higher the % inhibition the better the activity. Ascorbic acid was taken as standard and the values

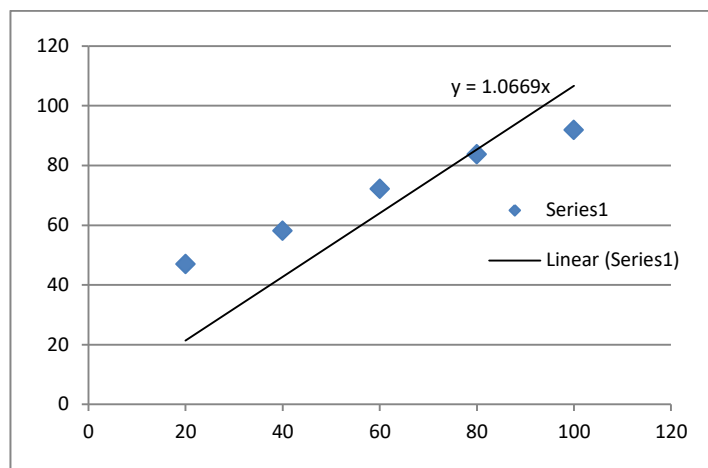
were comparable with concentration ranging from 20µg/ml to 100µg/ml. A dose dependent activity with respect to concentration was observed Table 2 & Figure 1, 2.

**Table 2: % Inhibition of ascorbic acid and methanolic extract using DPPH method**

S. No.	Concentration (µg/ml)	% Inhibition	
		Ascorbic acid	Methanolic extract
1	20	46.97	43.2900433
2	40	58.12	53.1385281
3	60	72.12	65.4761905
4	80	83.74	72.9437229
5	100	91.81	84.7402597
<b>IC 50</b>		<b>24.34</b>	<b>62.66</b>



**Figure 1: DPPH radical scavenging activity of Ascorbic acid**



**Figure 2: DPPH radical scavenging activity of extract**

## CONCLUSION

It can be concluded that from present investigation the observed level of phytoconstituents revealed that *Rosa indica* is a rich source of antioxidant compounds proved by in vitro studies. Currently available synthetic antioxidants are suspected to cause or prompt negative health effects, hence strong restrictions have been placed on their application and there is a trend to substitute them with naturally occurring antioxidants. Further phytochemical studies are also required to isolate and characterize active ingredients that are responsible for its in vivo antioxidant activity and to explore the existence of synergism if any, among the compounds.

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