



## EVALUATION OF ANTI-OXIDANT ACTIVITY OF *RHIZOMA IMPERATAE* USING NITRIC OXIDE SCAVENGING ASSAY

V.Gowri<sup>1\*</sup>, D.Anusha<sup>1</sup>, K.Punnagai<sup>2</sup>, Darling Chellathai David<sup>3</sup>

<sup>1</sup>Assistant Professor-Selection Grade, <sup>2</sup>Associate Professor, <sup>3</sup>Professor and Head,  
Dept. of Pharmacology, Sri Ramachandra Medical College and Research Institute,  
Porur. Chennai - 600 116, Tamilnadu, India.

### ABSTRACT

*Rhizoma Imperatae* is an herbal plant, prevalent in Asia and more commonly in china. *Rhizoma Imperatae* has a role in wound healing, anti-pyretic, anti-inflammatory and diuretic effect. Large numbers of medicinal herbs have been reported to exhibit antioxidant property and to drive the study as there was a minimal investigation that was performed on the antioxidant effect on this herb. The objective of this study was to evaluate the antioxidant activity of *Rhizoma Imperatae* using nitric oxide scavenging activity. The method implemented in this study was nitric oxide radical scavenging. *Rhizoma Imperatae* showed dose dependent antioxidant activity as compared to standard Quercetin. The maximum antioxidant activity was observed at 1000µg/ml with a percentage inhibition of 70.89%. This study proves that *Rhizoma Imperatae* has potent antioxidant activity which may be attributed to the large amount of polyphenols present in the extract. The free radical scavenging activity in addition to its inherent anti- inflammatory activity can be useful in treating chronic inflammatory conditions and may be used as novel antioxidant agents offering effective protection from free radicals in wide range of conditions.

**Key words:** *Rhizoma Imperatae*, Nitric oxide radical scavenging activity, Antioxidant activity.

### INTRODUCTION

Medicinal plants are used for treatment of many diseases because they have many characteristic properties like anti-inflammatory, anti-tumor, enhancing immunological functions (Lu Shijing and Huang Huailian 1996 and Pinilla V, Luu B 1999) and antioxidant activity which plays a promising role (Lai Wah Chan *et al.*, 2008). There are predominantly half million plants around the world, and most of them not yet investigated completely for these effects. *Rhizoma Imperatae* is an herbal plant, also named as Bai Mao Gen prevalent in Asia and more commonly in china. It is also available in Northern Africa, Turkey and in Iraq. It is harvested in spring and autumn seasons. The taste of the herb is sweet and the color is light yellow.

*Rhizoma Imperatae* has important ingredients such as coumarins, triterpenoids, 5-methyl flavones, saccharides, polyphenols, organic acids, including iron, potassium, and calcium.

Because of these ingredients it has anti-pyretic, anti-inflammatory, hemostatic, diuretic, anti-bacterial and anti-tumor effects (Zhou XR *et al.*, 2013 and Li-Na LN Fu *et al.*, 2010). For the treatment of hematuria, glomerulonephritis, and jaundice and treating influzena, *Rhizoma Imperatae* is commonly used (Lei Wang *et al* 2010).

So in this study we have focused in exploring the antioxidant activity of *Rhizoma Imperatae* using Nitric oxide scavenging assay.

### OBJECTIVE

To evaluate the antioxidant activity of *Rhizoma Imperatae* using nitric oxide radical scavenging activity.

Corresponding Author

V. Gowri

E-mail: drgowri16@yahoo.com

## MATERIALS & METHODS

The materials and chemicals required for this method are plant material (twigs of *Rhizoma Imperatae*), ethanol, sodium nitroprusside and Griess reagent. Instrument used in this study are soxhlet extractor, rotary vacuum evaporator and spectrophotometer.

The plant twigs are kept in shade to dry and then powdered. The soxhlet extractor was used with ethanol for extraction. The extracted powder was then concentrated by a rotary vacuum evaporator. With the help of spectrophotometer, Nitric oxide scavenging activity was measured.

Alderson et al method (Alderson WK *et al.*, 2001 and S Latha *et al.*, 2011) was used to find the antioxidant activity. 3 ml of reaction mixture containing sodium nitroprusside (10mM in phosphate buffered saline) and various concentrations (10, 50, 100, 200, 400, 800, 1000 µg/ml) of the extracts were incubated at 37°C for 4 hours. To the incubation solution, 0.5 ml of Griess reagent was added and the absorbance was read at 546nm and compared with Quercetin (Standard). The percentage inhibition was calculated using the formula.

% inhibition =

$$\frac{\text{Absorbance of Control} - \text{Absorbance of Sample}}{\text{Absorbance of Control}} \times 100$$

## RESULTS AND DISCUSSION

The above data revealed that *Rhizoma Imperatae* has significant antioxidant activity. For a minimal concentration of 10µg/ml, the percentage inhibition of the extract was 7.62%. As the concentration was gradually increased, the percentage inhibition progressively raised. The maximum antioxidant activity was observed at 1000µg/ml with a percentage inhibition of 70.89% for extract in comparison to the Quercetin (standard). Thus extracts of *Rhizoma Imperatae* (twigs) showed dose dependent antioxidant activity as compared to standard Quercetin. This study proves that *Rhizoma Imperatae* has potent antioxidant activity which may be attributed to the large amount of polyphenols present in the extract. Polyphenols are chemicals which protect the body cells and chemicals from free radicals. There are strong evidences for the role of polyphenols in preventing neurodegenerative diseases, cardiovascular disorders and cancer.

**Table 1. Nitric oxide radical scavenging activity of twigs of *Rhizoma Imperatae***

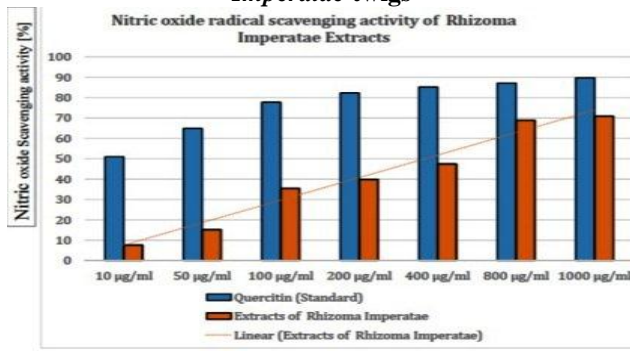
Concentration (ug/ml)	% Inhibition of Nitric Oxide Free Radicals	
	STD (Quercetin)	Twigs of <i>Rhizoma Imperatae</i>
10	50.95 ± 1.99	7.64 ± 5.42
50	64.85 ± 0.32	15.21 ± 0.74
100	77.70 ± 1.41	35.46 ± 1.07
200	82.28 ± 1.51	39.84 ± 1.44
400	85.18 ± 1.17	47.48 ± 1.26
800	87.16 ± 1.64	68.90 ± 1.97
1000	89.71 ± 0.25	70.89 ± 0.98

Results were presented as Mean ± S.E.M of three values.

**Figure 1. Twigs of *Rhizoma Imperatae***



**Figure 2. Antioxidant activity of extracts of *Rhizoma Imperatae* twigs**



## CONCLUSION

From the above results, it is demonstrated that *Rhizoma Imperatae* twigs has a dose dependent antioxidant activity. The free radical scavenging activity in addition to its inherent anti-inflammatory, antipyretic, diuretic, antibacterial and hemostatic effects, may also be used as novel antioxidant agents offering effective protection from free radicals in wide range of conditions.

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