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ANTIOXIDANT ACTIVITY OF *IXORA PAVETTA ANDR*

K. Srinivas[1] and R.V. Celestin baboo*[2]

[1]Department of Pharmacognosy, Sri Vasavi Institute of Pharmaceutical Sciences, Pedatadepalli, Tadepalligudem, West Godawari, Andhra Pradesh, India.

*[2]Department of Pharmacognosy, A. M. Reddy Memorial College of Pharmacy, Narasaraopet, Guntur, Andhra Pradesh, India.

ABSTRACT

The ethanolic extract of flowers of *Ixora pavetta* was screened for *in vitro* antioxidant activity by DPPH, Hydrogen peroxide and Nitric oxide methods. Ascorbic acid was used as reference standard. The extract showed significant antioxidant activity with all the selected methods as compared to standard ascorbic acid.

KEY WORDS

Anti-oxidant and *Ixora pavetta.*

Author for Correspondence:

Celestin baboo R V,

A. M. Reddy Memorial College of Pharmacy, Narasaraopet, Guntur,

Andhra Pradesh, India.

Email: celestinbaboo@gmail.com

INTRODUCTION

Ixora pavetta Andr. is a small tree or evergreen shrub, belonging to the family Rubiaceae. It is commonly found in deciduous slopes and hills. Flowering and fruiting takes place throughout the year[1]. The flowers are white, pleasant, agreeable and aromatic odour with bitter in taste. The petals occupy 2-3 cm in diameter, calyx truncate; 4 toothed, corolla tubular; lobes 4, obtuse, stamens 4; anthers basally tailed. The bark is grey brown to dark brown in colour, the leaves are simple, oblong, elliptic, oblanceolate, obtuse-acute symmetrical base; entire margin opposite decussate arrangement, simple type. Fruits are globose, 2 seeded, somewhat

didymous, dark purple in colour, the seeds are oblong, brown in colour, having bitter and disagreeable taste. The flowers are used in the treatment of dysentery, leucorrhoea, dysmenorrhea, haemoptysis and catarrhal bronchitis. A decoction of the flowers employed as a lotion for eye troubles, for sores and ulcers. Root of *Ixora pavetta* is used as bitter tonic, aperients, purgative, urinary disorders and is frequently prescribed in visceral obstructions. The bark part is used as hepatoprotective and leaf is used in the treatment of dysentery[2].

MATERIAL AND METHOD

Collection and Identification of plant material

The flowers of *Ixora pavetta Andr*. were collected during February 2010 from the costal regions of Kanyakumari District, Tamil Nadu. The specimen of the plant material was identified and authenticated by Mr.V.Chelladurai, Research officer-Botany, Central Council for Research in Ayurveda and Siddha (Government of India), Tirunelveli, Tamil Nadu, India.

Preparation of the extract

The flowers of *Ixora pavetta Andr.* were dried under shade and powered into coarse state. The coarse powder was extracted with ethanol using cold percolation method[3]. The extract obtained was used to determine *in vitro* antioxidant activity by DPPH, Hydrogen peroxide and Nitric oxide methods.

Anti-oxidant activity

DPPH Method

DPPH solution (0.004%w/v) was prepared in ethanol. The stock solution of extract and standard ascorbic acid was prepared. From the stock solution various dilutions of 10µg/ml, 20µg/ml, 30µg/ml, 40µg/ml, 50µg/ml and 100µg/ml were prepared. 2ml of freshly prepared DPPH solution was added in each dilution. The mixture was incubated in dark for 30 minutes and the absorbance was measured at 517 nm[4].

Hydrogen peroxide method

The ability of the extracts to scavenge hydrogen peroxide was determined according to Nabavi method. A solution of hydrogen peroxide (40mM) was prepared in phosphate buffer, pH 7.4. Different concentrations (10-100 µg/ml) of the extracts were prepared with hydrogen peroxide solution. The absorbance was measured at 230 nm after fifteen minutes of stabilisation against a blank solution containing phosphate buffer without hydrogen peroxide. Ascorbic acid was used as positive control[5].

Nitric oxide method

Nitric oxide radical inhibition was estimated by the use of Griess Illosvoy reaction. In this investigation, the reaction mixture (3ml) containing sodium nitroprusside (10m M, 2ml) phosphate buffer saline (pH 7.4, 0.5ml) and the extract (10-100 µg/ml) standard (ascorbic acid) solution was incubated at 25^0C for 150 minutes. After incubation, 0.5ml of the reaction mixture was mixed with 1ml of sulphanilic acid reagent (0.33% in 20% glacial acetic acid) and allowed to stand for 5 minutes for the completion of diazotization reaction. Further, 1ml of naphthyl ethylene diamine dihydrochloride was added, mixed and allowed to stand for 30 minutes at 25^0C. The concentration of nitrite was assayed at 540 nm and was calculated with the reference to the absorbance of standard[6, 7].

The experiment was done in triplicate. The percentage of inhibition of DPPH, Hydrogen peroxide and Nitric oxide methods were calculated by using the following formula.

$$\% \text{ inhibition} = \frac{\text{Absorbance of control} - \text{Absorbance of test}}{\text{Absorbance of control}} \times 100$$

RESULTS

The results of antioxidant activity of ethanolic extract of flowers of *Ixora pavetta* by different methods have been displayed in the Table No.1, 2 and 3. The IC_{50} values for scavenging of free radicals by DPPH, Hydrogen peroxide and Nitric oxide method for *Ixora pavetta* were 204.12, 311.17 and 262.45 respectively. The reference compound ascorbic acid showed IC_{50} value of 48.06, 42.18 and 67.73 for DPPH, Hydrogen peroxide and Nitric oxide method respectively.

Table No.1: Anti-oxidant activity of ethanolic extract of flowers of *Ixora pavetta* by DPPH Method

S.No	Concentration (µg/ml)	*Ixora pavetta*		Standard (Ascorbic acid)	
		% Inhibition	IC_{50}µg/ml	% Inhibition	IC_{50}µg/ml
1	10	20.43±1.33	204.12	60.41±0.095	48.06
2	20	29.96±2.59		71.36±0.045	
3	30	39.14±0.22		81.47±0.455	
4	40	49.64±0.14		85.93±0.04	
5	50	59.04±0.88		91.23±0.03	
6	100	68.22±2.005		96.46±0.075	

Table No.2: Anti-oxidant activity of ethanolic extract of flowers of *Ixora pavetta* by Hydrogen peroxide method

S.No	Concentration (µg/ml)	*Ixora pavetta*		Standard (Ascorbic acid)	
		% Inhibition	IC_{50}µg/ml	% Inhibition	IC_{50}µg/ml
1	10	5.75±0.87	311.17	49.11±0.325	42.18
2	20	12.06±1.5		60.35±0.125	
3	30	21.60±1.025		71.62±0.025	
4	40	28.46±0.865		79.26±0.23	
5	50	36.59±0.55		86.25±0.0152	
6	100	48.22±3.35		93.61±0.075	

Table No.3: Anti-oxidant activity of ethanolic extract of flowers of *Ixora pavetta* by Nitric oxide method

S.No	Concentration (µg/ml)	*Ixora pavetta*		Standard (Ascorbic acid)	
		% Inhibition	IC_{50}µg/ml	% Inhibition	IC_{50}µg/ml
1	10	28.72±0.385	262.45	43.86±0.92	67.73
2	20	35.47±0.045		59.64±0.94	
3	30	42.31±0.055		68.46±0.98	
4	40	45.51±0.416		73.62±0.91	
5	50	46.56±0.035		88.84±0.89	
6	100	53.46±0.425		96.42±0.73	

CONCLUSION

On the basis of the results obtained in the present study, it was concluded that the ethanolic extract of flowers of *Ixora pavetta* which contains compounds, exhibits antioxidant and free radical scavenging activities. It also chelates iron and has reducing power. These *in vitro* assays indicate that this plant extract is a significant source of natural antioxidant, which might be helpful in preventing the progress of various oxidative stresses. The present study provides evidence that the ethanolic extract of flowers of *Ixora pavetta* is a potential source of natural antioxidants.

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CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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