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Research Article

Antioxidant Potential of Various Parts of *Delonix regia*

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ABSTRACT

The young leaves, buds, petals and pods of *D. regia* were analysed for antioxidant potential. The various concentrations of methanolic extract were used for detection. It was noticed that the DPPH radical scavenging activity of leaves and flower, petals exhibits higher than the buds and pods. The metal reducing power and H_2O_2 scavenging of leaves, flower, buds and pods shows overall similar antioxidant potential but less than the standards. Thus plant parts of *D. regia* might be utilized in various nutritional and pharmaceutical formulations as a natural source to improve its antioxidant potential.

Keywords: *Delonix regia*, antioxidant potential

INTRODUCTION

Plants have been used for health and medicinal purpose since thousand years. They are one of the rich and important sources of medicine since human civilization. Now a day, it is preferred to use plant based medicines over synthetic medication for the treatment of different diseases because of their safety and cost effectiveness. Herbal medicines are particularly used by traditional practitioners since ancient times, in spite of their poor scientific data. *Delonix regia* is branched, broad, spreading, flat-crowned deciduous tree and is well-known for its brilliant display of red-orange bloom, flowering from May to July. It looks like a Royal Poinciana in full bloom. The leaflets are fine and soft making Royal Poinciana a favourite shade tree in large, open lawns.Though the chemical composition (Gupta *et al*. 2005) and medicinal properties (Sethuraman *et al*. 1986) have been well established for the other species of *Delonix* (*D. elata*), only a very few preliminary reports are available on the chemistry and biological potential of *D. regia* (Seetharam *et al*., 2002).

MATERIAL

In the present study, different parts of *Delonix regia* (Plate1) i.e. leaves, buds, petels and seeds were collected from botanical garden, Shivaji University, Kolhapur.

METHODS

The buds, flowers, young leaves and pods were collected, washed and blotted to dry and kept in oven for drying at 50^0 -60^0C. The dried parts were pulverized in grinder and used for further analysis. These plants parts were extracted in methanol and used for further studies. Free radical scavenging potential in methanol extract was measured (Blois, 1958) using 2, 2-diphenyl-1-picrylhydrazyl (DPPH). Reducing power was determined using methanol extract following a modified method from Oyaizu (1986). The level of lipid peroxidation (LPX) was measured in terms of malondialdehyde (MDA), a product of LPX estimated by thiobarbituric acid (TBA) Reaction (Heath And Packer, 1968). Metal chelating activity was determined according to the method of Dinis *et al.*, (1994). Hydrogen peroxide scavenging capacity of the extract was determined using the method described by Ruch *et al.*, (1989). FRAP assays were performed according to the method described by Benzie and Strain (1996).

RESULTS AND DISCUSSION

The methanolic extract of leaves and flowers showed higher DPPH radical scavenging activity than buds and pods, which might be useful to support oxidative process and helps to improve the antioxidant potential of food products if leaves and flowers are used in various nutraceutical and food products as additives. Reducing power of leaves, flowers and buds of *D. regia* might be responsible for reducing capacity and are involved in the prevention of chain

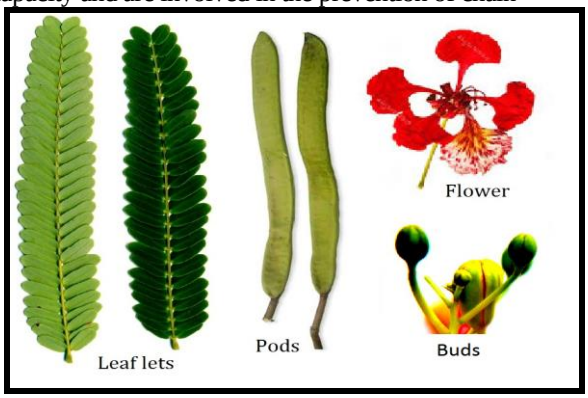

Plate 1: Different parts of *Delonix regia.*

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Table 1: The DPPH activity in different parts of *Delonix regia*.

D. regia	DPPH in %		
	0.1 ml	0.2 ml	0.3 ml
Leaves	38±1.58	65±1.88	88±1.1
Flowers	32±1.32	59±1.70	81±1.12
Buds	21±1.11	43±1.96	52±1.89
Pods	8.56±1.92	10.76±1.95	20.81±1.87
BHT	88.3±1.67	90.3±1.03	92.4±1.47

Table 2: The reducing power ability in different parts of *Delonix regia*.

D. regia	*Reducing* power in Absorbance		
	0.1 ml	0.2 ml	0.3 ml
Leaves	0.243±0.024	0.499±0.048	0.88±0.058
Flowers	0.233±0.043	0.421±0.045	0.71±0.057
Buds	0.147±0.056	0.333±0.024	0.591±0.097
Pods	0.38±0.025	0.58±0.048	0.71±0.056
AA	0.44±0.10	0.66±0.08	0.90±0.08

Table 3: The metal chelating activity in different parts of *Delonix regia*.

D. regia	Metal Chelating Activity in %		
	0.5 ml	1.0 ml	1.5 ml
Leaves	4.15±0.49	10.24±0.7	15.33 ±0.70
Flowers	3.65±0.42	9.64±0.46	14.12±0.64
Buds	2.14±0.32	4.37±0.65	9.90±0.78
Pods	1.76±0.50	2.95±0.60	4.22±0.70

Table 4: H_2O_2 Scavenging activity in different parts of *Delonix regia*.

D. regia	H_2O_2 Scavenging in %		
	0.05ml	0.1ml	0.2ml
Leaves	12.89±0.97	17.93±0.89	27.58±0.51
Flowers	11.55±0.68	16.06±0.59	25.63±0.76
Buds	8.45±0.35	10.78±1.05	20.58±0.84
Pods	3.384±1.33	4.14±0.54	3.7±0.48
BHT	21.52±0.95	38.12±1.41	52.65±0.31

initiation, binding of metal ions, decomposition of peroxides and radical scavenging. The chelating ability of the *D. regia* extract has been compared with that of EDTA; a known metal ion chelator. The metal chelating activity was concentration dependent. The *D. regia* methanolic extracts were capable of scavenging hydrogen peroxide in a concentration dependent manner. The different parts of methanolic extracts exhibited 27.58±2.51; 25.63±0.76; 20.58±0.84 and 3.7±0.87 percent inhibition respectively, whereas the leaves extracts exhibited 12.89±0.97; 17.93±1.89 and 27.58±2.51 percent inhibition respectively, at the concentration of 0.05ml; 0.1ml and 0.2ml by hydrogen peroxide scavenging activity. On the other hand, at the same concentration (BHT) butylated hydroxy toluene exhibited 21.52±1.33; 38.12±1.41 and 52.65±1.31 percent inhibition respectively. The percentage inhibition values of *D. regia* methanolic extracts of leaves, flowers, buds and pods extract are 50% as compared to standard (BHT). The methanolic extract of *D. regia* Gamble was reported to have antioxidant properties (Aqil *et al*., 2006). Four flavanoids isolated from the flowers of *D. regia* have been reported to show strong antioxidant activity against various free radicals (Su *et al*., 1997). Saleh *et al*., (1976) reported the presence of two anthocyanins – cyanidin-3-glucoside and cyanidin-3-gentiobioside – in the flowers.

CONCLUSION

The results confirmed that *Delonix regia* represent to be a potential source of antioxidants with nutritional values. All the studied *Delonix* plant parts showed noticeable DPPH, metal chelating activity, H_2O_2 Scavenging activity and reducing power ability.

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