International Standard Serial Number (ISSN): 2249-6807

International Journal of Institutional Pharmacy and Life Sciences 1(3): November-December 2011

INTERNATIONAL JOURNAL OF INSTITUTIONAL PHARMACY AND LIFE SCIENCES

Life Sciences **Research Article……!!!**

Received: 18-11-2011; Accepted: 23-11-2011

ANTIOXIDANT EFFECT OF THE STEM AND LEAVES OF *ERYTHRINA INDICA* LINN

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Keywords:

Antioxidant, *Erythrina indica*, root, leaves, papilionaceae

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ABSTRACT

Erythrina indica Lam is used in the traditional medicine as diuretic. In the present study, the antioxidant activity of of Ethanol, Chloroform and Ethyl acetate extract of leaves and stem of *Erythrina indica* Lam was studied and the activity was compared with DPPH and BHT as standard. By employing DPPH (2,2-diphenyl-1picrylhydrazyl radical)scavenging assays, it was shown that all the ethanol extracts of leaves and stem were showing antioxidant activity.

As expected, their potency varied according to the different parts and species. In particular, leaves and stems of *Erythrina indica leaves* displayed the highest activity. The the extracts tested were ranged from 0.176 mg/mL –2.45mg/mL. It is generally accepted that a diet rich in plants is associated with a reduced incidence of degenerative diseases, such as atherosclerosis and cancer. This study suggests that the *Erythrina indica* plants could be pharmaceutically exploited for antioxidant properties.

INTRODUCTION

Erythrina indica is a medium-sized, spiny, deciduous tree normally growing to 6-9 m (occasionally 28 m) tall and 60 cm .[12,13,]Young stems and branches are thickly armed with stout conical spines up to 8 mm long, which fall off after 2-4 years; rarely, a few spines persist and are retained with the corky bark.[4,5,6] Bark smooth and green when young, exfoliating in papery flakes, becoming thick, [1,2]corky and deeply fissured with age. Leaves trifoliate, alternate, bright emerald-green, on long petioles 6-15cm, rachis 5-30 cm long, prickly; leaflets smooth, shiny, broader than long, 8-20 by 5-15 cm, ovate to acuminate with an obtusely pointed end. Leaf petiole and rachis are spiny, flowers in bright pink to scarlet erect terminal racemes 15-20 cm long; stamens slightly protruding from the flower. Fruit a cylindrical torulose pod, green, turning black and wrinkly as they ripen, thin-walled and constricted around the seeds. There are 1-8 smooth, oblong, dark red to almost black seeds per pod. Erythrina comes from the Greek word 'eruthros' meaning red, alluding to the showy red flowers of the Erythrina species. It is used traditionally for the treatment of liver trouble, joint pain, dysentery, convulsion, as a diuretic, laxative and an Anthelmintic 1-3. A perusal of literature revealed that its antioxidant eff ects remain tobe studied. Herein, we report the antioxidant effect of the ethanol, chloroform, and ethyl acetate extract of leaves and stem of *Erythrina indica in vitro.*

Free radicals are potentially important in a number of ailments states that can have severe effects on the cardiovascular system, either through lipid per oxidation or vasoconstriction [1].

Damage to cells caused by free radicals is believed to play a central role in the aging process and in disease progression.([7,8)] Antioxidants are our first line of defense against free radical damage, and are critical for maintaining optimum health and wellbeing. The need for antioxidants becomes even more critical with increased exposure to free radicals. Pollution, cigarette smoke, drugs, illness, stress, and even exercise can increase free radical exposure.[9,10,13])Because so many factors can contribute to oxidative stress, individual assessment of susceptibility becomes important .Many experts believe that the

Recommended Dietary Allowance (RDA) for specific antioxidants may be inadequate and, in some instances, the need may be several times the RDA. As part of a healthy lifestyle and a well-balanced, wholesome diet, antioxidant supplementation is now being recognized as an important means of improving free radical protection.

Although the antioxidant defense systems includes both endogenously and exogenously derived compounds, dietary plants based antioxidant have recently received a great attention [2]. Hence many studies have been performed to identify antioxidant compounds with pharmacological activity and a limited toxicity from medicinal plants. In this context, ethno pharmacology plays a significant part in the search for interesting and therapeutically useful plants. In order to contribute to the knowledge of plants from India in the present study, *Erythrina indica* Linn.[14,15] And plant parts were screened to determine their free radical scavenging and antioxidant activities.

MATERIALS AND METHODS

Plant Material

The plant materials used in this study, roots of *Erythrina indica* were collected from the field in khandala tal. Shrirampur dist ahmrdnagar .identified by Dr. A.K.Mohite R.B.N.B College SHRIRAMPUR., India. A voucher specimen of the collected sample was deposited in our institutional herbarium for the reference.

Preparation of plant extracts

100g of dried and powdered plant material (leaves, and stem) were extracted at room temperature with 500 mL of methanol under constant shaking for 24 h. After filtration, the methanolic (MeOH) solutions were evaporated to dryness in a rotary evaporator for the biological assays. Then followed by ethyl acetate, ethanol, chloroform, etc with same procedure .

DPPH scavenging test

Quantitative measurement of radical scavenging properties was carried out in a universal bottle. The reaction mixture contained 50 µL of test samples (or 80% MeOH as blank)

and 5 mL of a 0.004% (w/v) solution of DPPH in methanol. Different known antioxidants, vitamin E, and butylatedhydroxytoluene (BHT, Sigma) were used for comparison or as a positive control. Discoloration was measured at 517 nm after incubation for 30 min. Measurements was taken at least in triplicate. DPPH radical's concentration was calculated using the following equation:

$$\text{DPPH scavenging effect (\%)} = \text{Ao} - \text{A1} / \text{Ao} \times 100$$

Where Ao was the absorbance of the control and

A1 was the Absorbance in the presence of the sample

The actual decrease in absorption induced by the test compounds was compared with the positive controls. The mean OD 517 results of DPPH scavenging activity was recorded.

RESULTS AND DISCUSSION

There is a strong need for effective antioxidants from natural sources as alternatives to synthetic antioxidant in order to prevent the free radicals implicated diseases which can have serious effects on the cardiovascular system, either through lipid per oxidation or vasoconstriction [1, 4]. The extracts and essential oils of many plants have been investigated for their antioxidant activity [5-7]. Secondary metabolites such as polyphenols are not required for plant development and growth, but are involved in plant communication and defense [8-9]. Polyphenols interact with pathogens, herbivores, and other plants; they protect from ultraviolet radiation and oxidants, repel or poison predators and attract beneficial insects or microbes [10-11] .

Therefore, in this study, the antioxidant properties of the methanol extracts of leaves and stems of plant like of re examined for

DPPH radical scav*enging* activity according to the method described and the results of the screening are shown in table 1 to table 2 as comparable with known antioxidant BHT .In terms of antioxidant activity, all the extracts investigated exhibited activity (more than 40%). In particular, leaves (ethanol extract) of *Erythrina indica* displayed the highest activities as antioxidant activity as removal of the stable radical DPPH and the lowest

activity were found in CCl_4 extract of stem. As expected, the overall activity of the raw extracts was lower than that of commercial antioxidant BHT, the reference antioxidant .

Result Table I: Antioxidant activity of leaves

Extract Conc. Mg/ml	BHT	Ethanol	$CHCl_3$	CCl_4
0.05	45.1	15.11	13.53	16.47
0.1	46.91	24.64	19.53	10
0.2	49.24	22.24	18.50	14
0.3	57.57	20.12	10.00	11.5

Result Table II: Antioxidant activity of stem:

Extract Conc. Mg/ml	BHT	Ethanol	$CHCl_3$	CCl_4
0.05	45.1	18	15	12
0.1	46.91	14	14	11
0.2	49.24	12	10	09
0.3	57.57	15	12	18

ACKNOWLEDGEMENT

We are grateful the Principal, R.B.N.B.College, Shrirampur for providing labs. (Nikhil analytical & research laboratory, Sangali for their technical assistance)

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