World Journal of Pharmaceutical Sciences
ISSN (Print): 2321-3310; ISSN (Online): 2321-3086
Published by Atom and Cell Publishers
Available online at: http://www.wjpsonline.org/
Original Article

Antioxidant activity of *Eria Alba* extracts

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Received: 05-02-2016 / Revised: 09-04-2016 / Accepted: 24-04-2016 / Published: 28-04-2016

ABSTRACT

The present study was performed to evaluate antioxidant activity of *E. alba.* The air dried powdered of plant material was extracted with petroleum ether, ethyl acetate and methanol and concentrated using rotary evaporator. The methanolic extract of *E. alba* and ethyl acetate fraction had significant scavenging effects with increasing concentration in the range of 100-400µg/ml. The methanolic extract showed significant antioxidant activity as compared to ethyl acetate and petroleum ether extract.

Keywords: *Eria alba,* DPPH and Total antioxidant capacity.

INTRODUCTION

The genus *Eria* (Orchidaceae) belongs to the tribe coelogyneae, It contain about 375 species in tropical Asia, Polynesia and Australia.50 species are found in india.Commonly found througout the Himalayan region at the altitude of 2200-3000m [1]. Most plants of the genus *Eria* found in India grow as epiphytes. Some are also found growing on moist, moss covered rock structures on large, hilly slopes [2]. On the earth, out of 4, 22,127 plant species, about 35,000 to 70,000 species are used as medicinal plants. In the third world countries, 20,000 plants species are believed to be used medicinally [3]. At present, the pharmaceutical sector in India is making use of 280 medicinal plant species, of which 175 are found in the IHR [4]. The plants of this genus have been studied extensively because of the traditional medicinal uses associated with them. The leaves, stems and flowers are used mostly in folk medicine for the treatment of dysentery, treatment of asthma, coughs, bronchitis, eczema and wound healing. The plant leaves used as remedy for skin diseases to reduce swelling and pain [1]. Plants are used medicinally in different countries and are a source of many powerful and potent drugs [5].

A wide range of medicinal plant parts is used for extract as raw drugs and they possess varied medicinal properties. The different parts of plants used include flower, root, stem, fruits and modified plant organs. While some of these raw drugs are collected in smaller quantities by the local communities and folk healers for local used, many other raw drugs are collected in larger quantities and traded in the market as the raw material for many herbal industries [6].

MATERIAL AND METHODS

Collection and identification of plant materials: The fresh parts of whole plants of *Eria* alba were collected from the area of Guptakashi village (Distt. Rudraprayag Uttarakhand) in the month of September-October 2014. The plant was authenticated by Dr. C. S. Rana, Department of Botany, H.N.B Garhwal University, Uttarakhand, India.

Extraction process: The plant material was separated into its selected part whole plants air dried ground to moderately fine powder and soxhlet extracted with increasing polarity solvent (petroleum ether, ethyl acetate and methanolic). Each extract was evaporated to dryness under reduce pressure using rotary evaporator. The various concentrated extracts were stored in air tight container for further studies.

Determination of Antioxidant Activity
DPPH free radical scavenging activity: The Free radical-scavenging capacity of *E. alba* crude extract and its various fractions of *E. alba* was determined using the DPPH radical method. A 2 ml aliquot of test solutions was added to 2 ml of 2 x

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10-4 mol L-1 ethanolic DPPH solution. The mixture was shaken vigorously and the absorbance was measured at 517 nm immediately. All the tests were performed in triplicate and mean values calculated. The antioxidant activity was expressed according to the ability of an extract to scavenge DPPH free radicals and was determined using the following equation:

% Inhibition = [1- (A1-A2)/A0] x 100

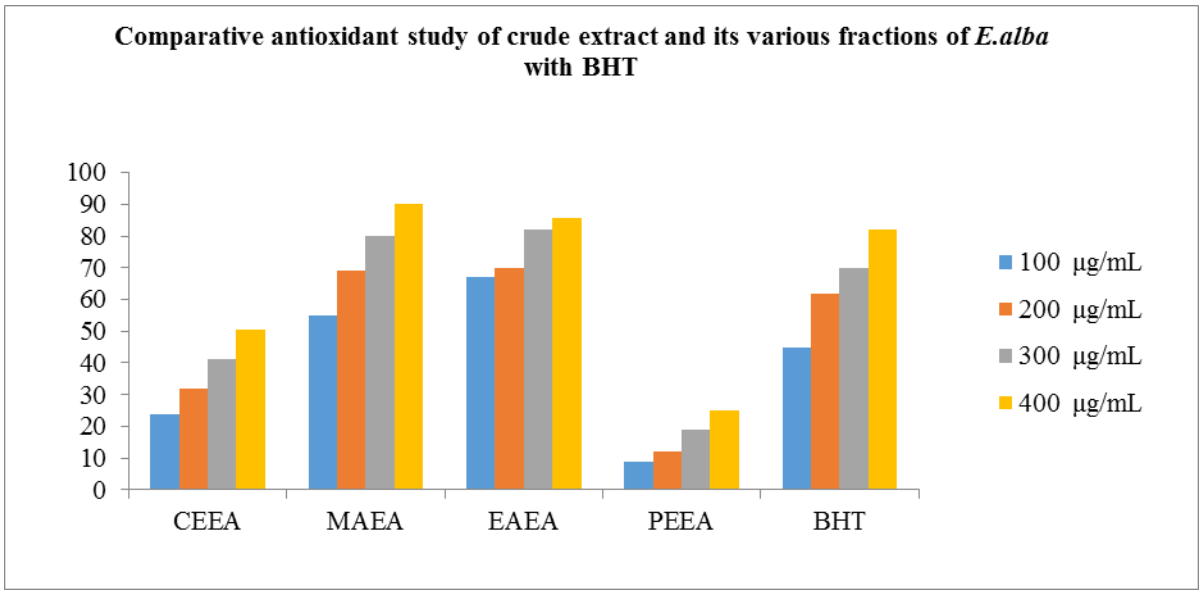
Where A_o is the absorbance of negative control (original DPPH sample without sample), A1 is the absorbance of test sample (DPPH sample in presence of sample) and A2 is the absorbance of sample without DPPH [7]**.** The IC50 value is the concentration (µg ml-1) of extract/standard necessary to reduce the absorbance of DPPH by 50% compared to the negative control. The IC50 was determined by interpolation from linear regression analysis of the antioxidant activity (% Inhibition) against sample concentration (µg mL-1) and the IC50 value decreases as a function of increasing antioxidant activity of samples.

Total antioxidant capacity: Sample (0.3ml) was mixed with 3.0ml reagent solution (0.6mM sulfuric acid, 28mM sodium phosphate and 4mM ammonium molybdate). Reaction mixture was incubated at 95ºC for 90 minute under water bath. Absorbance of all the sample mixtures was measured at 695nm [8]. Total antioxidant capacity was expressed as ascorbic acid equivalent per gram extract (mgAAE/g).

RESULTS AND DISCUSSION

DPPH free radical scavenging activity: The antioxidant activity assay was carried out to assess the ability of the medicinal extracts to scavenge free radicals in vitro (expressed as TEAC value) by the DPPH assay. Total antioxidant activity, measured by the DPPH method, ranged from *E. alba* showed methanolic and ethyl acetate extract showed the highest antioxidant activity (90.35%± and 85.664%). The IC_{50} values (µg/ml) of different extract are given in Table 1.

Figure1. DPPH scavenging activities of the different solvent extracts of *Eria alba.*



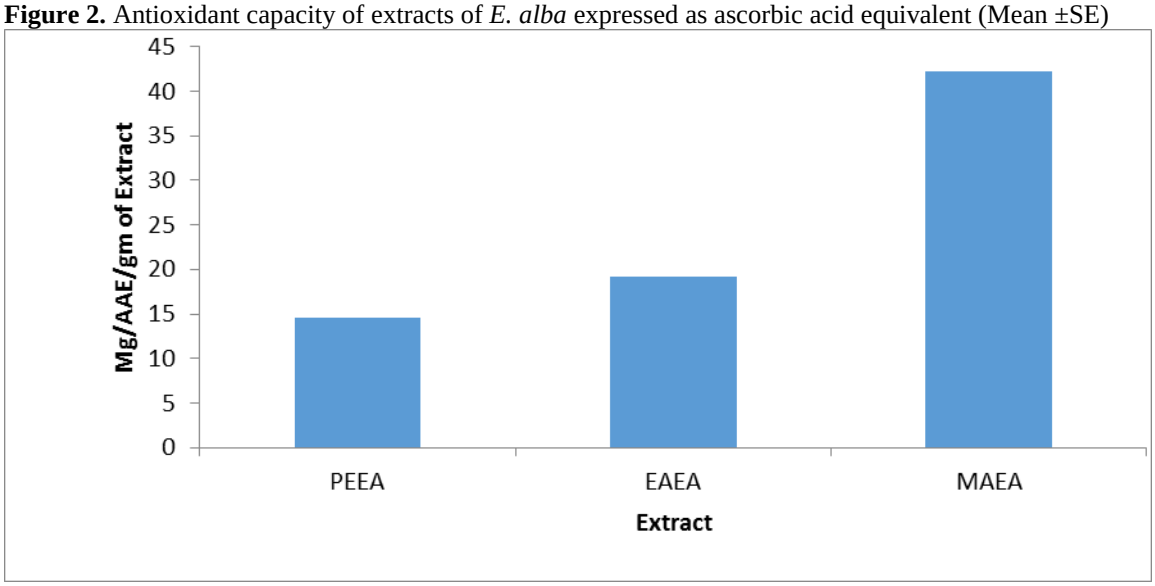
Abbreviation: MAEA = Methyl alcohol *E. alba* soluble extract; EAEA = Ethyl acetate *E. alba* soluble extract; PEEA = Petroleum ether *E. alba* soluble extract; CEEA = Ethyl alcohol Crude extract *E. alba;* BHT= butylated hydroxyl toluene,

Table 2. Inhibitory concentration (IC_{50}) of *E. alba* crude extract and its various fraction

Concentration (400µg/mL)	CEEA	MEEA	EAEA	PE EA	BHT
IC_{50}	408.047	68.725	54.135	838.645	171.054

Total antioxidant capacity: The total antioxidant capacity determination by phospho molybdenum method is based on the reduction of molybdenum VI (Mo6+) to form a green phosphate/Mo5+ complex at acidic pH which can be estimated by measuring absorbance at 695nm. High absorbance values indicate potential antioxidant capacity of the sample. Ascorbic acid (AA) was used as a standard. The calibration curve of ascorbic acid was used to determine the total antioxidant capacity of *E. alba*. The antioxidant capacity of petroleum ether, ethyl acetate and methanolic extracts are 14.60±2.1, 19.10±4.35 and 42.31±3.2 respectively. The methanolic extract showed the highest total antioxidant capacity when compared to ethyl acetate and petroleum ether extract.

Figure 2. Antioxidant capacity of extracts of *E. alba* expressed as ascorbic acid equivalent (Mean ±SE)



Abbreviation: MAEA = Methyl alcohol *E. alba* soluble extract; EAEA = Ethyl acetate *E. alba* soluble extract; PEEA = Petroleum ether *E .alba* soluble extract;

CONCLUSIONS

In conclusion, all tested extracts exerted significant anti-oxidant activity to different concentration. The *E. alba* plant extract were screened first time for antioxidant activity. The crude extract and methanolic fractions of *E. alba* were found strong DPPH scavenging activity. At a lower concentration of 400µg/ml. The findings of this study suggest that the tested plants or their combinations can be developed as effective herbal remedies for the treatment and prevention of antioxidant or associated diseases.

ACKNOWLEDGEMENTS

The authors are grateful for the financial support from the UGC New Delhi under the Fellowship Scheme. The author also thanks to the Deptt. Of Chemistry H. N. B. Garhwal (A Central University) Srinagar Garhwal Uttarakhand India for the research works.

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