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Evaluation of Aqueous Extract of *Eclipta alba* Leaves for Preservative Potential Against *Fusarium Species*

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ABSTRACT

An aqueous extract of the leaves of *Eclipta alba (Astraceae)* was obtained by cold maceration process and tested for it antimicrobial activity against *Fusarium species* to ascertain preservative potential in food products. The screening was performed against *Fusarium oxysporum* and *Fusarium subglutinans* by agar plate disc diffusion method at 50 µg/ml and 100 µg/ml concentrations. The results were interpreted by Kirby-Bauer standard and indicated that the extract showed significant antimicrobial property against *Fusarium species*, however, predominant activity was found against *Fusarium oxysporum.*

Keywords: *Eclipta Alba*, Aqueous extract, Antimicrobial, preservative, *Fusarium species.*

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INTRODUCTION

Disease is an illness to human health and being associated with integral part of man from the beginning of his existence. The disease may be caused by polluted environment, genetic and food habits etc. The subject of food and the preservative is also becoming most determine factor for health. Owing to the toxicity and potency of synthetic preservatives created threat and awareness in the public health. The search for remedies to combat it is perhaps equally old and for more than a millennium, herbal has been extensively used, apparently safely and effectively, in Asian countries, especially in China, Japan and Korea, to alleviate various symptoms of disease[1] Now a days, food poison and related infectious diseases becoming hurdle task for food product manufactures in controlling food poison and in selection of food preservatives. There are many microbial organisms are responsible for food contaminations and were well studied by several researchers. Amongst all microbes *Fusarium species* such as *Fusarium oxysporum* and *Fusarium subglutinans* are pathogenic and produce toxins during food contaminations, hence its results severe health hazards such as neurological, gastrointestinal and cardiovascular disorders.

Eclipta alba, family *Compositae* (English: Kadimulbirt) is a mesophytic herb, a common annual weed found throughout India and elsewhere at an altitudes up to 2000 m. This tropical annual is a creeping and moisture-loving herb; it has a short, flat or round, brown stem and small white flowers on a long stalk. It grows 3" tall; the leaves are opposite and lance-shaped. Leaves are sessile, 2.5-7.5cm long, oblong, lanceolate, subentire, acute or subacute sparsely strigose with appressed hairs on both sides and with a tapering base[2-4]. The juice of the plant is used as a popular remedy for jaundice, fever, painful swelling, anemia, dysentery, eye diseases, asthma and liver cirrhosis[5]. The juice of *Eclipta* together with honey is used to treat upper respiratory congestion in children. Root has been reported to possess emetic and purgative property[6]. The tincture of the plant is used for liver and kidney problem[7-9] and it is also reported to have therapeutic potential against cardiovascular disorders[10]. Upon on observation of plant potential in therapeutics and its neuro-protective and antioxidant property, the present work was under taken to reveal the suitability of aqueous extract with respect to antimicrobial activity against *Fusarium species* for its preservative potentials in food and related products as dual benefits.

MATERIALS AND METHODS

Preparation of the Extract

Eclipta alba leaves were collected during March 2012 from Coimbatore, India. The plant was identified by the Botanist, Botanical survey of India, TNAU, India. The herbarium of the plant

was authentified (No. 1251/p/2012) and stored in the Department of Biotechnology, Kumaruguru College of Technology, Coimbatore, India. The leaves were dried under shade and made into a coarse powder and passed through 80 mesh. 300 g each of powdered materials was extracted with 600 ml water by cold maceration process for one week to afford aqueous extract. The extract was concentrated *in vacuum* to dryness and the extractive value was 4.677%[11]

Phytochemical tests

The leaf extracts prepared were evaluated for their chemical constituents as described by the method of Brain et al[12]. The plant extract was subjected to TLC using mobile phase of Dichloromethane and methanol in the ratio of 85:15(%v/v) and the developed spots showed positive results for terpenoids, alkaloids and flavonoids with reagents such as vanillin - sulphuric acid and Dragondroffs reagent, respectively.

Antimicrobial activity

The extract was evaluated for their *in-vitro* antifungal activity against *Fusarium oxysporum* and *Fusarium subglutinans* by agar plate disc diffusion method. Potato Dextrose Agar (PDA) was used as medium. The species well identified by pigmentation, viz purple and pink pigmentation respectively for *Fusarium oxysporum* and *Fusarium subglutinans.* The antimicrobial susceptibility discs were used in the study. The discs were placed on aluminum foil and added 10µL of the resinous extract in dimethyl formamide (DMF) at concentrations of 5mg/mL and 10 mg/mL equivalent to a concentration of 50µg/disc and 100µg/disc, respectively. The discs were allowed to absorb the extract completely. The method was performed in triplicate at room temperature. Clotrimazole (10µg/disc) were used as standard drug. DMF was employed as blank. The results of the test were interpreted as per Kirby-Bauer method[13].

RESULTS AND DISCUSSION

The plant extracts of *Eclipta alba* have been extracted by maceration as per British Pharmaceutical codex and preserved under refrigeration until the experimental usage to avoid microbial contaminations, however, the extract has not proven any microbial growth even upon exposure to atmosphere during drying, thus the extracts qualifies test for antimicrobial activity. The extract to be as resinous and their DMF solutions were used for the experimental purpose owing to the good solubility nature. Preliminary phytochemical screening the extract showed the presence of terpenes, flavonoids and alkaloids with reagents such as vanillin - sulphuric acid and Dragondroffs reagent, respectively. DMF was proven to be biologically inert for the current study. The screening was performed against *Fusarium oxysporum* and *Fusarium subglutinans* by

agar plate disc diffusion method at dual concentrations of 50 µg/ml and 100 µg/ml. The results were interpreted by Kirby-Bauer standard and indicated that the extract showed significant antimicrobial property against *Fusarium species*, however, predominant activity was found aginst *Fusarium oxysporum.* (17 mm and 19 mm respectively for extract and standards). (Table 1 and figure 1) The results were dose dependent. With reference to the chemical constituents of *Eclipta alba* such as alkaloids, flavanoids, terpenoids and the present results of the present biological evaluation, it suggests that antimicrobial potential may be due to the potential flavanoids and/ or alkaloids. Further work may be extended to isolate the active constituents for their biological potential and is continuing our interest too.

Table – 1 Antifungal activity of aqueous leaves extract of *Eclipta alba*

Contents of sterile disc	Antifungal (in mm zone inhibition)	
	Fusarium oxysporum	***Fusarium subglutinans***
AE 50µg/disc	14	12
AE 100µg/disc	17	14
Std[a]	19	21
Blank[b]	06	06

The above results mean of triplicate and are presented as zone inhibition in millimeter (Disc diameter 5 mm).[a]clotrimazole (10µg/disc) were used as standard. [b]DMF was used as blank.

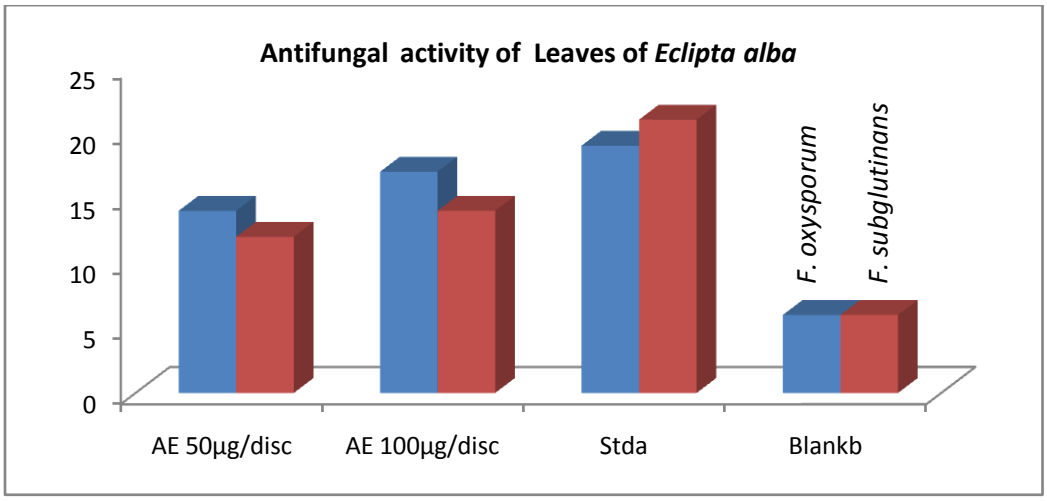

Figure - 1 Preservative potential of leaves of *Eclipta alba*

CONCLUSION

The antifungal screening revealed that the extract showed significant antifungal activity against *Fusarium species*, however, predominant activity was found aginst *Fusarium oxysporum* comparable to the standard drug (clotrimazole). The current study indicates the suitability of *Eclipta alba* leaves extract for growth inhibition of tested fungi species.

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