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Screening of phytochemicals of some weeds and antibacterial potential against *Staphylococcus aureus*

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ABSTRACT

The ethanolic extract of some weeds were tested against human pathogen *Staphylococcus aureus* which cause skin infection and found that alcoholic extract was more toxic against this pathogen. Phytochemical analysis of various parts of the weeds were screened and found that alkaloids, flavonoids, terpenoids, steroids, phenolic compounds, saponins and glycoside were present. Out of these some chemical compounds provide protection against pathogenic infection.

Key words: Antibacterial potential, *Staphylococcus aureus*, Phytochemical analysis.

INTRODUCTION

Weeds are economically important as they could be used for food, fodder, medicinal, Biofertilizer, Biomass based energy, soil conservation and other purposes[1, 8]. They synthesize some chemicals themselves which metabolite their physiological activities. These phytochemicals were used to cure the disease in herbal and homeopathic medicines. Now-a-days most of the people like to use the traditional methods to cure general diseases because they don't cause any side effects, low cost and are easily available in our environment. In the present investigation, the weeds such as *Achyranthes aspera*, *Boerhaavia diffusa*, *Tridax procumbens*, *Cleome icosandra*, *Gomphrena celosoides*, *Commelina benghalensis*, *phyla nodiflora*, *Euphorbia hirta*, *Acalypha indica* and *Croton bonplandianum*, were tested against the human pathogen *Staphylococcus aureus*.

It causes significant infections in humans like diarrhoea, nausea, vomiting, crampy abdominal fever, shock, hypotension, headache and sun burn like rash that leads to peeling of the skin, especially on the hands and feet [6]. The most serious aspects of this disease, however are a sudden drop in blood pressure, shock and possible heart failure. The ethanolic extract of weeds have inhibited the growth of the pathogen *S. aureus*.

MATERIALS AND METHODS

Preparation of ethanolic extract

The vegetative parts such as leaves, bark and flowers were removed separately and shade dried under room temp (37°C) and ground into powder with mortar and pestle. These powdered forms were kept in hot air oven for complete drying. These dried powdered materials were used for making plant extraction. A known quantity (100g) of dried powdered material from the plant were taken in soxhlet apparatus and soaked in 600ml of ethyl alcohol separately in bottles and closed with corks and were kept for seven days the extracts were filtered through Whatman no-1 filter paper. The extracts were collected in bottles and kept in refrigerator and is called as stock solution from the stock solution different concentration of the extracts were prepared using distilled water.

Qualitative phytochemical analysis

Preliminary phytochemical analysis were carried out by using 80% ethanolic extracts according to [3] and [5] methods.

Test for Alkaloids (Mayer's Test)

The extract of *Abrus precatorius*. L was evaporated to dryness and the residue was heated on a boiling water bath with 2% Hydrochloric acid. After cooling, the mixture was filtered and treated with a few drops of Meyer's reagent. Yellow colour was observed. It indicates that the presence of Alkaloids.

Test for Flavonoids

1 ml of the plant extract and a few drops of dilute sodium hydroxide were added. An intense yellow colour was produced which became colourless on addition of a few drops of dilute acid indicates the presence of flavonoids [7].

Test for Terpenoid and Steroid

4 ml of extract was treated with 0.5 ml of acetic anhydride and 0.5 ml of chloroform. Then concentrated solution of sulphuric acid was added slowly. Red violet colour was observed for terpenoid and green bluish colour for steroids [2].

Test for Phenolic compounds

The plant 5 ml was dissolved in distilled water. Then few drops 1% lead acetate was added. A bulky white precipitate was formed, which indicates that the presence of phenolic compounds.

Test for saponins

The plant extract 50ml was diluted with 20 ml of distilled water and it was agitated in a graduated cylinder for 15 minutes. The formation of 1 cm layer of foam showed the presence of saponins.

Test for Glycoside

The plant extract 5ml is mixed with glacial acetic acid, few drops of ferric chloride and concentrated sulphuric acid are added and observed for reddish brown colouration at the junction of two layers and the bluish green colour in the upper layer was formed. It indicates the presence of glycosides.

Antibacterial sensitivity test

The plant extracts were tested for antibacterial activity in the disc diffusion method of antibacterial activity was expressed as the ratio of the inhibition zone.

RESULTS AND DISCUSSION

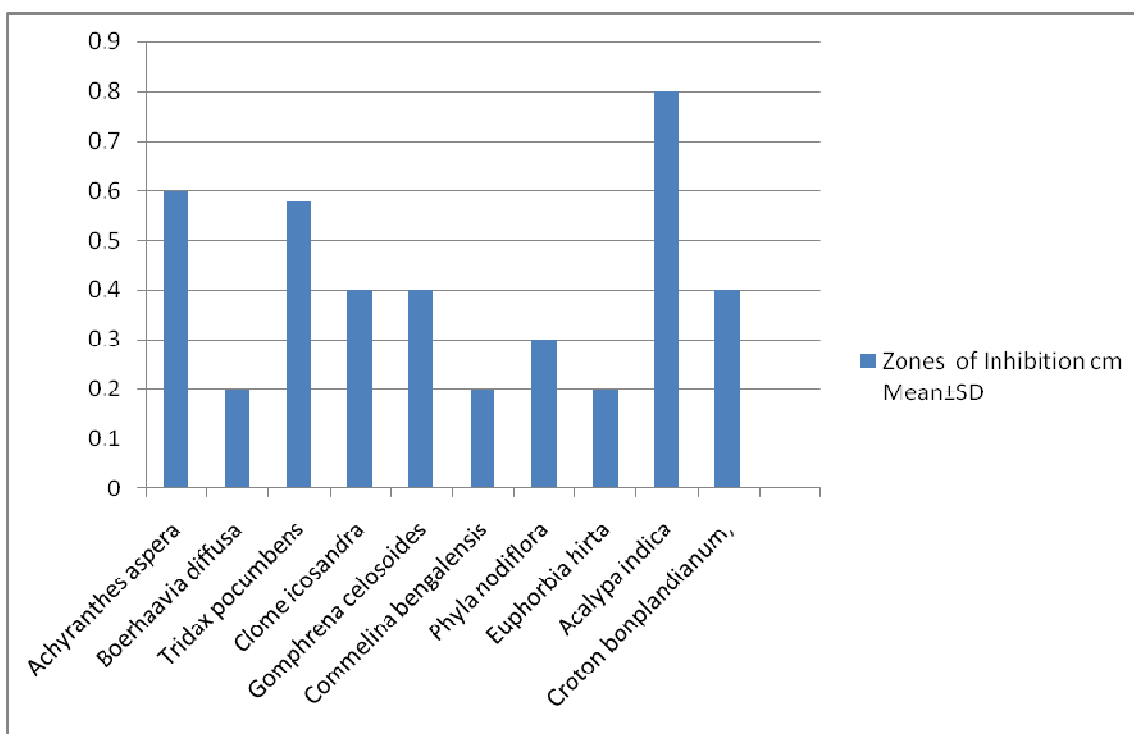
The effect of antibacterial activity of ethanolic extract of different weeds have been shown in **Table-1**. The result clearly indicates that increasing concentration of the extract decreases the microbial growth among the ten different weeds, the ethanolic extract of *Acalypha indica*, showed high degree of inhibition ($0.08=0.2\text{cm}$) against *S.aureus*.

Second maximum suppression of bacterial growth was shown by ethanolic extract of *Achras aspera* ($0.6=0.02\text{cm}$) followed by *Tridax procumbens* ($0.5=0.08\text{cm}$). Phytochemical analysis of weeds were recorded in **table -2**.

Screening of phytochemicals of some selected weeds

S.No	Plants Name	Phytochemical Components						
		Alkaloids	Flavonoids	Terpenoids	Steroids	Phenolic compounds	Saponins	Glycoside
1	<i>Achyranthes aspera</i>	+	+	+	+	+	+	+
2	<i>Boerhaavia diffusa</i>	+	+	+	+	+	+	+
3	<i>Tridax pocumbens</i>	+	+	+	+	+	+	+
4	<i>Clome icosandra</i>	+	+	+	+	+	+	+
5	<i>Gomphrena celosoides</i>	+	+	+	+	+	+	+
6	<i>Commelina bengalensis</i>	+	+	+	+	+	+	+
7	<i>Phyla nodiflora</i>	+	+	+	+	+	+	+
8	<i>Euphorbia hirta</i>	+	+	+	+	+	+	+
9	<i>Acalypha indica</i>	+	+	+	+	+	+	+
10	<i>Croton bonplandianum</i>	+	+	+	+	+	+	+

+ inhibition, - no inhibition



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