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Microbiology of toxic shock syndrome and its control through herbal drugs

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ABSTRACT

Plants have been used in the treatment of various diseases from the time immemorial. In this present aspect, some of the plant extracts were screened for their antibacterial efficiency against the human pathogen S. aureus which causes various skin diseases and toxic shock syndrom. This investigation reveals that the selected plant extracts have antibacterial potential against S.aueus, which gives accurate remedy against wide spectrum of diseases caused by the same.

Key words: Antibacterial potential, *Staphylococcus aureus*,

INTRODUCTION

Toxic shock syndrom which is caused by *staphylococcus aureus* is characterized by low blood pressure, fever, diarrhea, an extensive skin rash and shedding of the skin, nausea, vomiting, crampy abdominal fever shock, hypotension, headache [8]. 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 pathogens. The traditional methods especially the use of herbs still play a vital role to cover the basic health needs in the developing countries [2]. Since then there have been explorations in different parts of the world to identify such plants that can be potential sources for antimicrobial substances.

However, the vast majority of the work has not been adequately evaluated [3]. Intensive search for newer and safer substitution from plant sources is worthwhile, since there have been undesirable side effects of some of the present day antibiotics and resistance developed by some bacteria to modern antibiotic therapy. In view of this, the present work was undertaken on ten different easily available Herbs which are associated with folk medicine even in India with reputations [4,5].

MATERIALS AND METHODS

Collection of Plant material

For the preliminary screening work, *Achyranthes aspera* Linn., *Acalypa indica, Eclipta alba* Hassak., *Phyllanthus niruri* Linn. *Solanum trilobatum* Linn., *Ocimum sanctum* linn., *Clemome icosandra* Linn. *Leucus aspera* Linn. and *Gynandropsis gynandra* Linn. were collected from road sides and fields.

Preparation of Extract
5% of ethanol, chloroform, hexane and aqueous extracts of the whole plant were made under sterilized conditions.

Composition of media used
Nutrient agar Medium
Peptone 5g, beef extract 5g, Nacl 5g, agar agar 20g, distilled water100 ml, pH 7. This medium was autoclaved at 151 b pressure for 15 minutes and melted in water bath. When this medium was completely molten, the flask was taken out and cooled to room temperature.

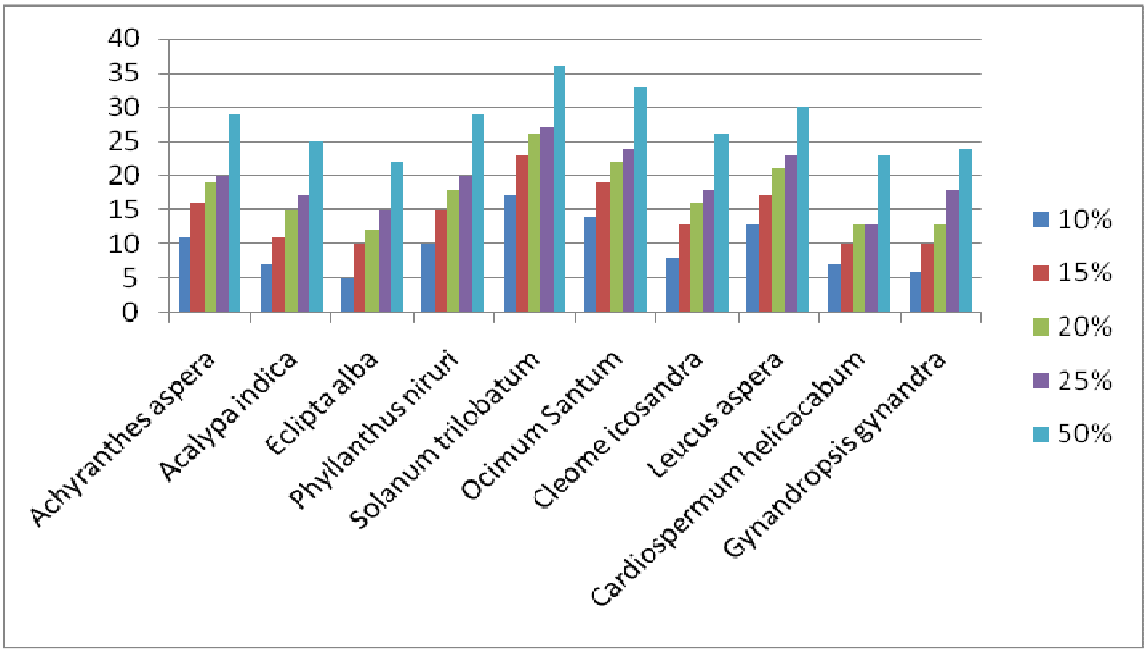
Broth culture
A loopful of *Staphylococcus aureus* from slant was taken in 100ml conical flask containing 30ml of liquied medium (broth) which was incubated at $27^0 \pm 1^0$c for 24 h for the future use as inoculum.

Effect of herbal extracts on *S. aureus*

S.No	Plants Name	5% Extract of			
		Chloroform	Ethanol	Hexane	Water
1	*Achyranthes aspera*	+	+	+	_
2	*Acalypa indica*	+	+	+	_
3	*Eclipta alba*	+	+	+	_
4	*Phyllanthus niruri*	+	+	+	_
5	*Solanum trilobatum*	+	+	+	_
6	*Ocimum Santum*	+	+	+	_
7	*Cleome icosandra*	+	+	+	_
8	*Leucus aspera*	+	+	+	_
9	*Cardiospermum helicacabum*	+	+	+	_
10	*Gynandropsis gynandra*	+	+	+	_

+ inhibition, - no inhibition

Effect of herbal Extracts against the pathogen *S.aureus*



% zone of inhibition in mm

Incubation of agar plates
To 30 ml of the molten medium was taken in a 100ml flask and 0.2ml of inoculum was poured and mixed thoroughly by shaking it well. 30ml of this was poured into each pair of petridishes under aseptic condition and these plates were incubated at room temperature.

For evaluation, the following methods were employed taking two replicates with a control set in each case.

Agar well assay methods
A single well (5mm dia.) was cut out from the centre of the sterile agar plate with a sterile cork borer. The well was filled with test preparation (5% extract) avoiding overflow.

Filter disc method
Sterile discs of 5mm dia. were cut out of whatman No.1 filter paper each of which was dipped three times into the test preparation draining it for a short period each time. Finally two such discs were placed opposite to each other in the plate.

RESULTS AND DISCUSSION

All types of extracts (chloroform, Ethanol and hexane) of all the ten plants proved inhibitory to human pathogenic organism *S.aureus* which cause Toxic shock syndrom **(Table1).**

Among the three extracts, ethanolic extract of plants showed maximum inhibitory zone against *S.aureus.*

The effects of antibacterial activity of ethanolic extract of different herbs have been shown in **Table-2**. Among the ten different herbs, the ethanolic extract of *Solanum trilobatum* showed the highest inhibitory activity (35mm) followed by *Ocimum Sanctum* on *S.aureus.*

[9] reported that crude extracts of Solanum trilobactum showed significant inhibitory activity against, the root knot nematodes. *Ocimum santum* showed antibacterial activity against S.*auresus* [6].

Moderate inhibitory activity was observed in *Leucus aspera* (30mm) *Phyllanthus niruri* (28mm), *Achyranthes aspera* (25mm) followed by *Cleome icosandra* (25mm), *Gynandropsis gynandra* (24mm) and *Acalypa indica* (24mm) at 50% concentration. *Acalypa indica* showed toxicity against *S.aureus, C.albicans* and *A.flavus* [1]. Mensah, J.L. studied the antibacterial activity of *Phyllanthus niruri* against *S.aureus* and *P.aeroginosa* [7]. Apparently very less inhibitory effect (22mm) was observed from the extracts of *Eclipta alba.*

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