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Antibacterial Potential of Tridax Procumbens L.

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ABSTRACT

In our present study, we carried out the antibacterial activity of plant *Tridax procumbens L.* which belongs to family asteraceae. The aim of the present work was to evaluate scientifically antibacterial potential of *Tridax Procumbens L.* Extract and its fractions. Extraction has been performed by Soxhlet apparatus with different solvents and then they get fractionated. Fractions of residue and filtrate evaluated for anti-bacterial activity by using agar-well diffusion method. Some of them fractions show remarkable activities against bacteria *Escherichia coli & Klebsiella.*

Keywords: Tridax Procumbens L, Klebsiella, Escherichia coli & Klebsella

I. INTRODUCTION

Increase of resistance to antibiotics by bacterial pathogens is a growing problem in both developed and developing countries [2]. Therefore it is required to overcome this problem by different way such as controlling the use of antibiotics, to develop research to better understanding of the genetic mechanism of resistance and to continue study to develop new drugs either synthetic or natural [3]. We know that the herbal plants are the valuable source of natural products for maintaining human health [4]. Plants are used medicinally in different countries and are a source of many potent and powerful drugs. Medicinal plants represent a rich source of antimicrobial agent [5]. Different parts of plants, herbs and spices have been used for many years for the prevention of infection. The use of plants with known antimicrobial properties can be of great significance in treatment of infections [6]. *Tridax Procumbens L.* is a plant used for its medicinal propery as a therapeutic agent with no side effects. It has been reported that the plant *Tridax Procumbens L.* have various pharmacological effects like hepatoprotective, mosquito repellant activity, leishmanicidal, immunomodulatory effect, wound healing activity and antiprotozoal effects [7,8,9,10]. The aim of the present work carried out was to evaluate scientifically the traditional use of *Tridax procumbens* as antibacterial potential. The present work aims at assessing the antibacterial property of *Tridax procumbens L.* plant extract through scientific study and to substantiate its medicinal use for infectious diseases.

II. EXPERIMENTAL

Plant collection and Preparation:

The plant *Tridax Procumbens L.* was collected from Awasari forest, Tal-Ambegaon, Dist- Pune, Maharashtra, India. The plant was identified from Botanical survey of India, Pune. A botanical specimen is preserved for further reference. The plant was dried under shade for 8-10 days. Immediately after drying, it was powdered using an electric mixer- grinder and sieved through a BSS mesh No. 85 sieve. The powdered sample was stored in airtight plastic container at room temperature for further analysis.

Extraction of Plant Sample:

Accurately weighed 20gm of the powder extracted by using a Soxhlet apparatus with mixture of methanol and water (500 ml) in volume ratio 4:1. The extract was cooled and filtered through whatman filter paper 41 and was used for further Fractionation process. The obtained residue also fractionated.

Fractionation of Residue: The residue was extracted with 125CC of (5 x 25 CC) of ethyl acetate and filtered it. The residue obtained after filtration comprised plant fibers. 0.05 gm separated fibers was weighed and transferred to 5 ml of ether and filtered through Whatman filter paper No.1. It was referred as Sample **I.**

The filtrate obtained from above process was evaporated to dryness on a water bath maintained at 45 C +- 5 ^{0}C after evaporation of ethyl acetate the beaker was allowed to cool at room temp in dessicator. It consists of fats and waxes. 0.05 gm of separated fats and waxes was weighed and transferred to 5 ml of ethyl acetate and filtered through Whatman filter paper No.1. It was referred as Sample **II**.

Fractionation of Extract:

The extract obtained was evaporated to approximately 1/10th its volume by heating in a water bath maintained at a temperature less than 70^{0}C. It was acidified with 2M H_2SO_4. The acidified filtrate was extracted using 150 ml (3 x 50 ml) chloroform in a separating funnel. The aqueous and the chloroform layers were thus separated. The aqueous Layer obtained was basified to pH=10 with 2M NaOH. It was further extracted with 120 ml (2 x 60 ml) chloroform: methanol in volume ratio 3:1 followed by extraction with 40 ml (2 x 20 ml) chloroform in a separating funnel. The aqueous Basic layer was evaporated to dryness on a water bath. After evaporation of the solvent the beaker was allowed to cool at room temp in a dessicator. It consists of quaternary alkaloids and N oxides. 0.05 gm separated alkaloids was weighed and transferred to 5 ml of Water and filtered through Whatman filter paper No.1. It was referred as Sample

The chloroform layer obtained from above extraction was evaporated to dryness on a water bath maintained at 45 ^{0}C. After evaporation of chloroform it was allowed to cool at room temp in dessicator. It consists of terpenoids. 0.05 gm of separated terpenoids was weighed and transferred to 5 ml of chloroform and filtered through Whatman filter paper No.1. It was referred as Sample **IV**.

The organic layer (Chloroform and methanol) was evaporated on a water bath at 45 ^{0}C. After evaporation of solvent it was allowed to cool at room temperature in a desiccator. After cooling the 0.05 gm of residue was weighed and transferred to 5 ml of Chloroform and methanol in volume ratio 3:1. The chloroform and Methanol extract was then collected and filtered through Whatman filter paper No.1 at room temperature. It was referred as Sample **V**.

The resulting Fractions (sample) were used to study antibacterial potential.

Sample	Solvent	Solvent extract	Weight in gm	Volume in ml
I	Ether(residue)	Fibers	0.05	5
II	Ethyl acetate	Fats & waxes	0.05	5
III	Water(filtrate)	Quaternary alkaloids & N-oxides	0.05	5
IV	Chloroform	Terpenoids & Phenolics	0.05	5
V	Chloroform & Methanol (3:1)	Alkaloids	0.05	5

Table 1 : Fractions of residue & Extract of Plant *Tridax Procumbens L.* for Antibacterial activity.

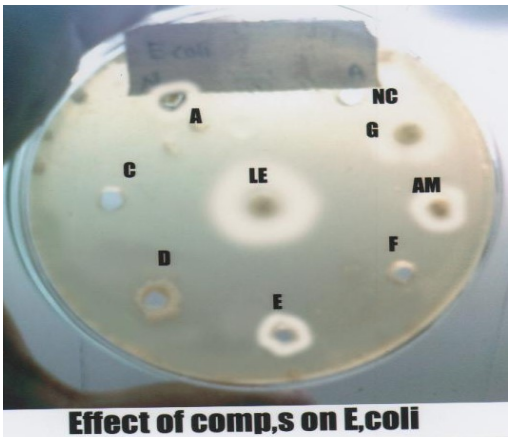
Evaluation for antibacterial Activities:

Evaluation for the antibacterial activities were carried out against bacterial strains *Escherichia coli & Klebsella* by the agar well diffusion assay using Nutrient Agar plates. The microbial work was carried out in aseptic area. The additions of the extract, medium and microbial culture was done as per standard procedure. The tubes were then inoculated with 0.05 ml of the standardized culture. The tubes were incubated at temp 37^{o}C for 24 hrs and observed for the turbidity produced. The test procedure was repeated to check the reproducibility of the result. The lowest concentration that can inhibit the growth is the Minimum Inhibitory Concentration. 40 µl of the sample was added to each well. The zones of inhibition produced by the extracts were compared with the standard Levofloxacin, Amoxycyline, Gentamycin.

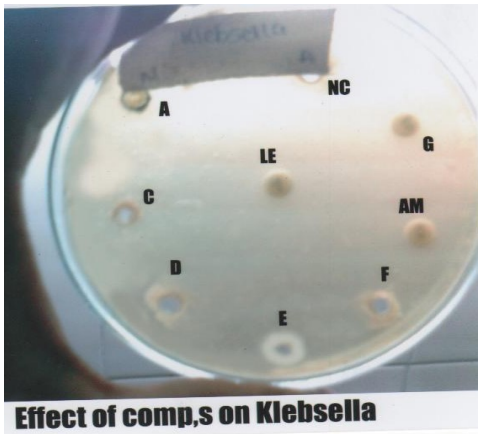
LF:Levofloxacin, **AM**: Amoxycyline, **G**: Gentamycin

Table 2: Antibacterial Activities of *Tridax Procumbens L Powder* Extracts.

Sr. No.	Sample	Bacteria	
		E.coli	*Klebsiella*
1	I	10	--
2	II	--	10
3	III	--	--
4	IV	10	10
5	V	12	--
6	LF	16	20
7	AM	10	10
8	G	--	12



Effect of comp,s on E,coli



Effect of comp,s on Klebsella

III. RESULTS AND DISCUSSION

The results of the present study observed that the extract and fractions prepared from the plant Tridax procumbens had inhibitory activity against some bacterial strains. Ethyl acetate fraction of residue (Fats & waxes) and Chloroform fraction of filtrate (Terpenoids & Phenolics) shows antibacterial activity against bacterial pathogens for Klebsiella. Ether fraction of residue (Fibers), Chloroform fraction of filtrate (Terpenoids & Phenolics) and Chloroform & Methanol (3:1) fraction of filtrate (Alkaloids) are biologically active against E. coli pathogen. As per given in table 2, aqueous fraction of filtrate (Quaternary alkaloids & N-oxides) does not show remarkable activities.

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