

**TO STUDY THE *IN VITRO* ANTI-MICROBIAL ACTIVITY OF
ETHANOLIC EXTRACT OF STEMS AND LEAVES OF THE PLANT
RICINUS COMMUNIS. (FAMILY- EUPHORBIACEAE)**

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ABSTRACT

Ricinus communis, the castor bean or castor-oil-plant, is a species of perennial flowering plant in the spurge family- Euphorbiaceae. It is the sole species of monotypic genus. The part leaf, stem, seed of the plant *Ricinus communis* shows the antimicrobial activity. That antimicrobial compounds that could be useful as an alternative to synthetic microbicides and are being used to develop drugs. The antimicrobial activity of various extracts of *Ricinus communis* was performed by Disc diffusion method to check the zone of inhibition of ethanolic extract was compared with that of standard drug i.e., azithromycine for anti-bacterial activity The results of antimicrobial

activity revealed that all the extracts showed good inhibitory activity against all the tested microbes. Chloroform and ethanol extracts of leaves, stem and seed showed comparatively better activity than petroleum ether extract. Thus *Ricinus communis* is an effective antimicrobial agent. And they can be used in the treatment of infectious diseases caused by microbes. Thus this plant is used as a medicinal plant for clinical use.

KEYWORD: *Ricinus communis*, Anti-microbial, Agar disc diffusion method, Zone of Inhibition etc.

INTRODUCTION

In nature each and every plant is a source of medicinal agent. And it is clear that plant kingdom of a plant is very much useful for the diseases as a medicinal use to recover the disease. The Euphorbiaceae is the fourth largest family of the angiosperms comprising over 300 genera and about 7500 species distributed widely in tropical Africa. The Euphorbiaceae

plants are shrubs, trees, herbs. According to WHO (1993), 80% of the world's population is dependent on the traditional medicine and a major part of the traditional therapies involves the use of plant extracts or their active constituents. By the continuous use of antibiotics, microorganisms have become resistant. And it can occur clinical problem in the treatment of infectious diseases. Wide variety of antibiotics are commonly used for the treatment of infections occurred by microbes. However, multiple drug resistance has developed due to excessive use of existing antimicrobial drugs in the treatment of infectious diseases. Antimicrobial resistance is harmful to mankind, because most of the infectious microbes become multiple drug resistant. *Ricinus communis* known as Castor oil plant of family Euphorbiaceae is a soft wooden small tree, wide spread throughout tropics and warm temperature regions of the world. About 80% of world population is still dependent on traditional herbal medicines. In Indian system of medicine, the leaf, root and seed oil of this plant have been used for the treatment of the inflammation and liver disorders, Hypoglycemic, Laxative. In the present study we have investigated antimicrobial potential of Indian *Ricinus communis* extracts against several bacteria^[1]

MATERIAL AND METHODS

Collection of the plant

The plant *Ricinus communis* is collected from the area of soils with a little higher sand content are well suited. It is grown in different type of soils from light black, sandy loam and red soils to clay loams. It grows on light black, ashy loam and red soils to stiff loams in irrigated and rain fed areas. The location of collection of plant is from the area of Morigaon, Assam.

Washing and Drying

After collection of the plant, wash the plant portion properly with running water. And then dry the plant parts for around 15 days. After drying properly we are going for grinding to form powder for extraction.

Authentication of plant material

The plant *Ricinus communis*, Family-Euphorbiaceae was authenticated by Dr. P.P.Baruah, Department of Botany Guwahati University.

Preparation of Solvent Extracts (drug)

The dried powdered of *Ricinus communis* was successively Soxhlet extracted using Petroleum Ether, chloroform and ethanol separately for 72 hr. The extracts were dried under reduced pressure using rotator evaporator to get the crude. A dark green semi-solid mass was obtained. It was stored below 4°C until further used.

Calculation of percentage yield = (Dry weight of the extract/Dry weight of sample) x100

Antibacterial activity

The antimicrobial activity of different plant extract was assayed by agar well diffusion method as described in NCCLS,1993. Bacteriological media is a wide range of types. Nutrient agar is a complex medium as it contains ingredients with unknown amount or types of nutrients. Nutrient agar contain beef extract (0.3%), peptone(0.5%), Agar(1.5%) and sodium chloride(0.5%)in water. Beef extract is commercially prepared dehydrated form of autoclazed beef and is supplied in the form of paste. Peptone is the casein that has been digested with the enzyme pepsin. Peptone is dehydrated and supplied as powder. peptone and beef extract contain a mixture amino acid and peptides of acids. Beef extract also contains water soluble digest products of all other macromolecules nucleic acids, fats, polysaccharides). As we know vitamin trace mineral. Although we know and can explain beef extraction this terms, each batch can't be chemically defined. There are many media ingredients which are complex yeast extract, tryptone and others. The advantage of complex media is that they support the growth of wide range of microbes. Agar is purified from red algae in which it is an necessary polysaccharide of thin cell walls. Agar is added to microbial media only as solidification agent. Agents for most purpose is nutrient value. Agar is an excellent solidification agent because it dissolves at near boiling but solidifies at 45⁰c, mix cells with it, and then allow it to solidify thereby trapping living cells. Below 45⁰c is a solid and remains so as the temperature is raised melting only when >95⁰c is obtained^[2]

RESULTS

The present study shows the phytochemical screening, anti-microbial activity of the ethanolic extract of the plant *Ricinus communis*.

Antbacterial activity: The plant extract are rich in antibacterial components. The *in vitro* antibacterial activity of the ethanolic extract of *Ricinus communis* is determined by the agar disc- diffusion method.

- Plant extract is generally rich in antimicrobial compound. The invitro antimicrobial activity of the ethanolic extract of *Ricinus communis* under different concentration with standard are appeared. The dried fruit extract of the plant *Ricinus communis* showed antimicrobial activity against a large portion of the test organ.

Table 1: Antibacterial activity of leaves and stems of ethanolic extract of *Ricinus communis* observed against the growth of bacteria using disc diffusion method.

Compounds	Inhibition zone <i>S. aureus</i> (mm)	Inhibition zone <i>E. coli</i> (mm)
A(1)	24.44	21.25
B(2)	17.11	16.82

Where, A = Azithromycine (30 µl), B = plant extract (100 µl)

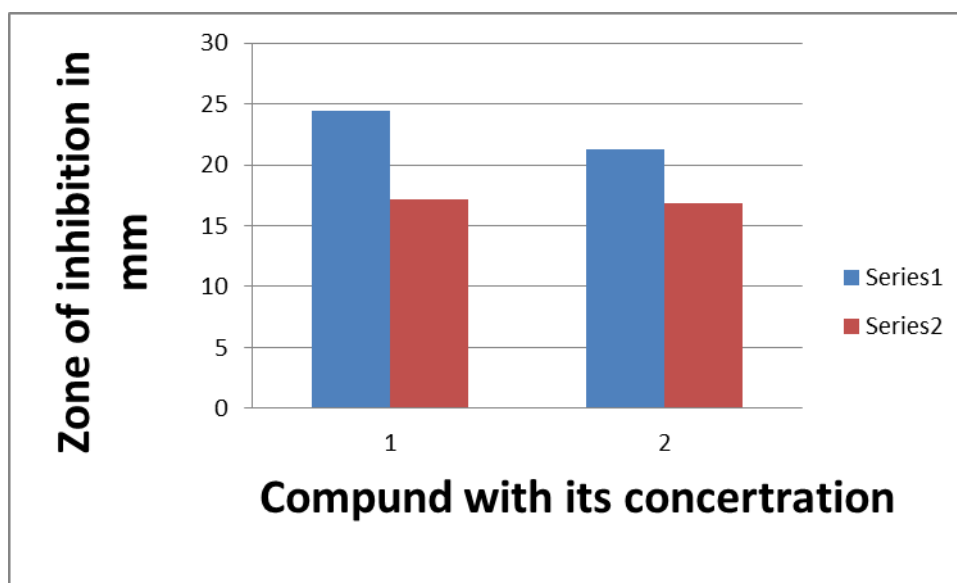


Fig: Zone of inhibition vs concentration.

CONCLUSION

The result confirms that it has the significant antimicrobial activity of the extract *Ricinus communis*. The plant extracts have great potential as antimicrobial compound against disease causing microorganisms. No doubt, the pathogens can develop resistance against the antibiotic if the same is used for longer periods of time and also if not necessary. The antibiotic is gradually unable to resist the growth of the pathogens.

This study includes the anti-microbial activity of the stems of *Ricinus communis*. was evaluated by using agar disk diffusion method. The microorganisms select to be studied were Gram positive i.e., *Staphylococcus aureus* and Gram negative i.e., *Escherichia coli*.

However, it always be in mind to prevent from resistant against microorganism while discovering new drugs, meanwhile it has been anticipated that this study would guide to the creation of some new compounds that can be used to develop a new and more powerful anti-microbial drugs.

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