EVALUATION OF ANTIBACTERIAL ACTIVITY OF KATANKATERYADI KWATHA

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Abstract:
Objective: Evaluation of the antibacterial activity of Katankateryadi kwatha.
Methods: The ethanolic extract of katankateryadi kwatha has good antibacterial activity against E. Coli, S. aureus, and ATCC strains. I have compared the antibacterial activity of this drug with the erythromycin with ATCC strain then it shows a better result than erythromycin by the Disc diffusion method.
Results: Antibacterial activity of the Katankateryadi Kwatha against the Gram-positive Staphylococcus aureus, gram-negative E. Coli, and ATCC strain has been performed successfully and showed the highest antibacterial activity for these bacteria by the disk diffusion method is 25 mm inhibition diameter at the 200mg/ml concentration of the drug, minimum inhibitory concentration of the drug 25 mg/mL has been tested and inhibition diameter is 13mm but exact MIC is not tested.
Conclusions: Katankateryadi Kwatha had the greatest potential value against both Gram-negative and Gram-positive bacteria(Staphylococcus aureus) but it give better antibacterial effect on gram negative bacteria(E. coli).

Keywords: Katankateryadi Kwatha

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1. INTRODUCTION [1-13]

Ayurveda is an ancient study of life and a medical care framework in the world. Its antiquity takes us to the Vedas. If we talk about Ayurveda, it is not just about getting rid of diseases, but it is balance to the body in every way like physical, mental and spiritual.

In Ayurvedic classics i.e. *Charaka-samhita* (1000 BC), *Susruta Samhita* (1000BC), *Astanghriday* (7th century AD), *Madhavnidana* (11th century AD), *Bhela Samita* (7th century AD) and many more, there are so many diseases and with their detail like etiology, sign ,symptoms and treatment are Describe in madhumeha.

There so many compound formulations have been developed and prescribed for the treatment of many disease among them Katankateryadi Kwatha is one of them and prescribe by *Chakradatta* (CD. Chi. 35/23), and *Gadanigraha* (GN Chi. 30/60) for the treatment of madhumeha.

Katankateryadi Kwatha has total six ingredients listed below-

S. No.	Common name	Botanical Name	Family	Part Used
1.	Daruharidra	*Barberis aristata* DC	Berberidaceae	Root
2.	Yastimadhu	*Glycyrrhiza glabra* Linn.	Fabaceae	Rhizome
3.	Haritaki	*Terminalia chebula* Tetz.	Combretaceae	Fruit
4.	Bibhitaki	*Terminalia bellirica* Roxb.	Combretaceae	Fruit
5.	Amlaki	*Emblica officinalis* Gaertn.	Euphorbiaceae	Fruit
6.	Chitraka	*Plumbago zeylanica* Linn.	Plumbaginaceae	Root

Ayurveda medical science has so many treatments for different diseases, but due to lack of and some scientific evidence, some facts are still hidden. So here we will try to find out the fact of the above-mentioned drug (Polyherbal formulation) through their phytochemical and pharmacological study.

2. MATERIAL AND METHODOLOGY

2.1 Preparation of Katankateryadi Kwatha.

I have taken an equal amount of katankateryadi kwatha ingredients and then by pulverizer reduced the size of all ingredients and make a coarse powder then I soaked in four times water then left overnight then kept boiling at 80-100 degree centigrade after that using cotton cloth filter the prepared kwatha then dry the kwatha by using rotatory evaporator then store the Kwatha in the freezer and then for pharmacological activity**.[14]**

3. ANTIBACTERIAL ACTIVITY [15]

We can make assumptions about antibacterial activity because this kwatha contains alkaloids, tannins, and flavonoids, which are phytochemicals present in medicinal plants that have antimicrobial and antioxidant characteristics.

There are numerous ways to conduct an antimicrobial test, but in this instance, I used the disc diffusion approach.

3.1. Antibacterial test by disk diffusion method [16]

The antimicrobial agent diffuses from discs at a specific concentration, and this process is referred to as "disc diffusion". Finding an inhibitory zone in the disc whose relationship to bacterial resistance to the antibiotic is inverse is the main goal of this test. The disc diffusion antibacterial test method is a culture-based microbiology assay used in drug development and diagnostic laboratories. Agar nutrition medium is used in the disc diffusion method. The disc diffusion antibacterial test is a culture-based microbiology assay used in diagnostic and drug development labs.

3.2. Composition of agar nutrient media

0.5% Peptone

It is use for the primary growth of bacteria

0.3% beef extract/yeast extract

It is used for the nutrient media for bacteria

0.5% agar

It is use for the solidification of content

0.5% NaCl

Use for the electrolytic balance in bacteria

Distilled water

It is very important for the growth and reproduce-tion of bacteria it provide the medium through which various nutrient can be transported.

- PH is adjusted to neutral (7.4) at 25 °C.

3.4. Preparation of agar nutrient media.

1- take all the ingredients
2- Completely dissolve all of the ingredients with continuous stirring, for dissolving purpose we can apply heat also.
3- Keep this all content in Autoclave for sterilization. at a temperature of 121° Celsius for the 15minuts.
4- After this, make it cool down but notice that it does not become solidified.
5- Pour each dish with nutrient agar, then leave until the agar nutrient media become solidified.

3.5. Inoculation and incubation [17]

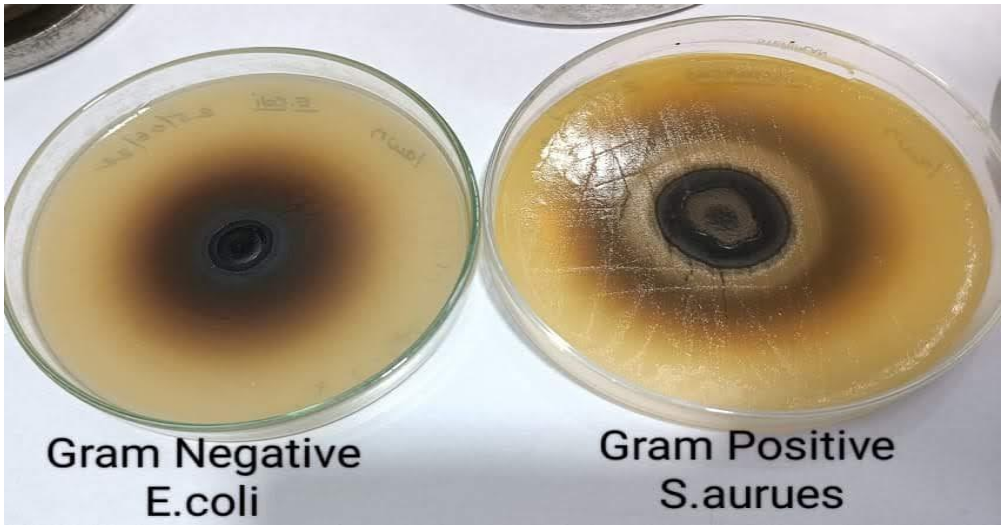
A sterile swab is used to collect the broth culture of a certain organism (E. coli and S. aureus) using an aseptic approach. Gram-negative bacteria are dealt with by gently pushing or spinning the swab against the interior of the tube to drain any extra liquid.

A bacterial lawn is created by streaking the swab across both plates. The agar plate is streaked with a swab in one direction, turned 120° and streaked again, rotated another 120° and streaked again, rotated another 120° and streaked again. After that with the help of a micropipette place the different concentration of kwatha like 25mg/ml, 50mg/ml, 100mg/ml, and 200mg/ml also.

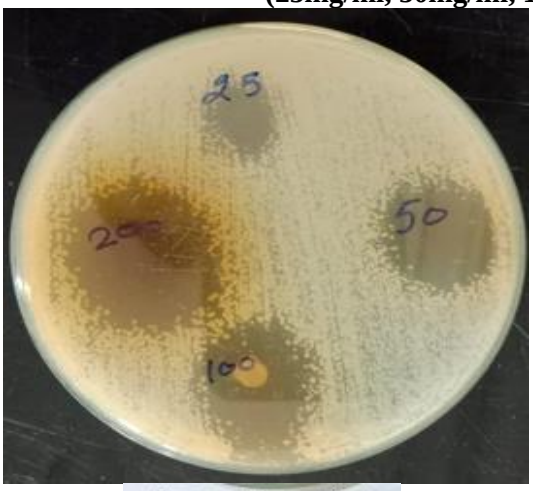
All the processes must be completed within 15 minutes of inoculation. Flame-sterilized forceps are used to gently, in the case of ATCC strain of bacteria place Ciprofloxacin disk in the center. Keep the plate incubation for overnight, usually the temperature of 35 °C must be maintained.

Concentration of bacteria Mac Fernald nub. = $1.5*10^8$ cells/ml

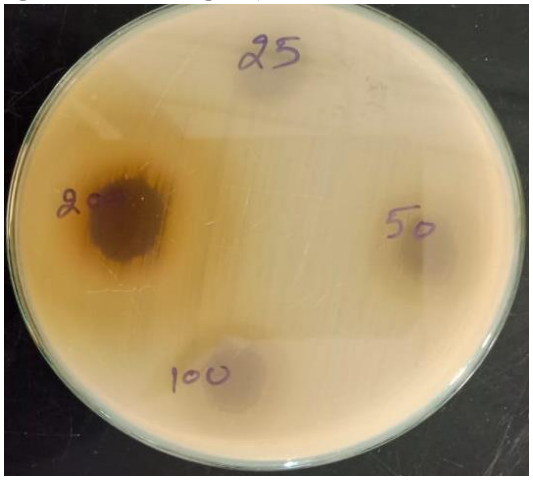
ONE DROP TEST OF KATANKATERYADI KWATHA



DIFFERENT CONCENTRATION OF KATANKATERYADI KWATHA.
(25mg/ml, 50mg/ml, 100mg/ml and 200mg/ml)



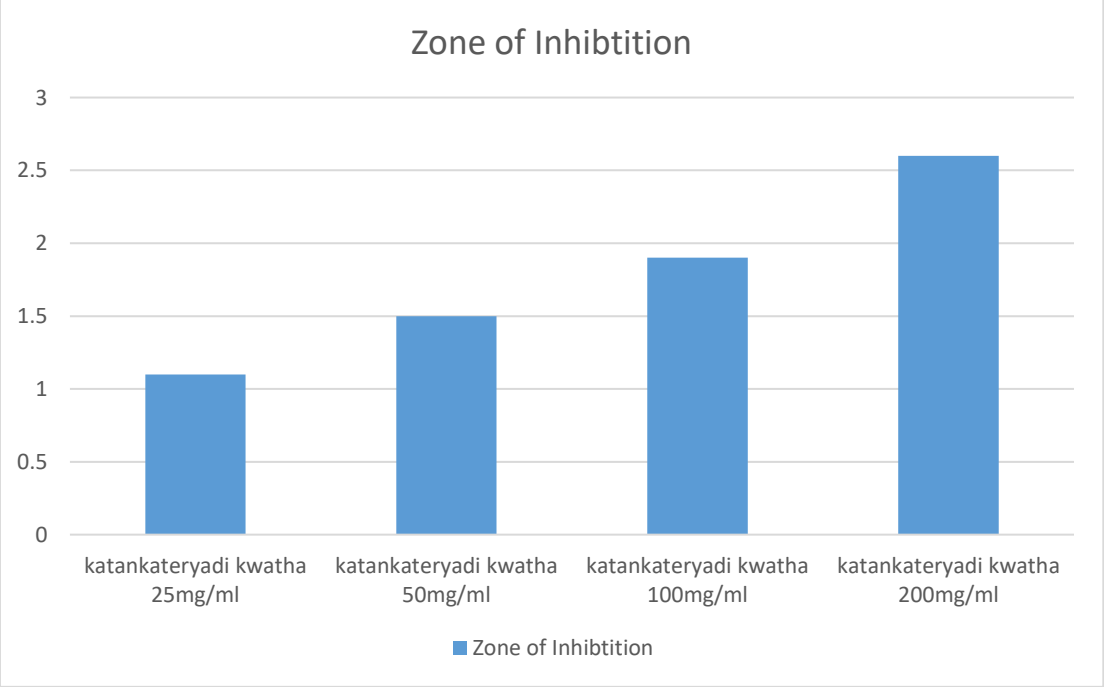
Gram Negative
E.coli



Gram Positive
S.aurues

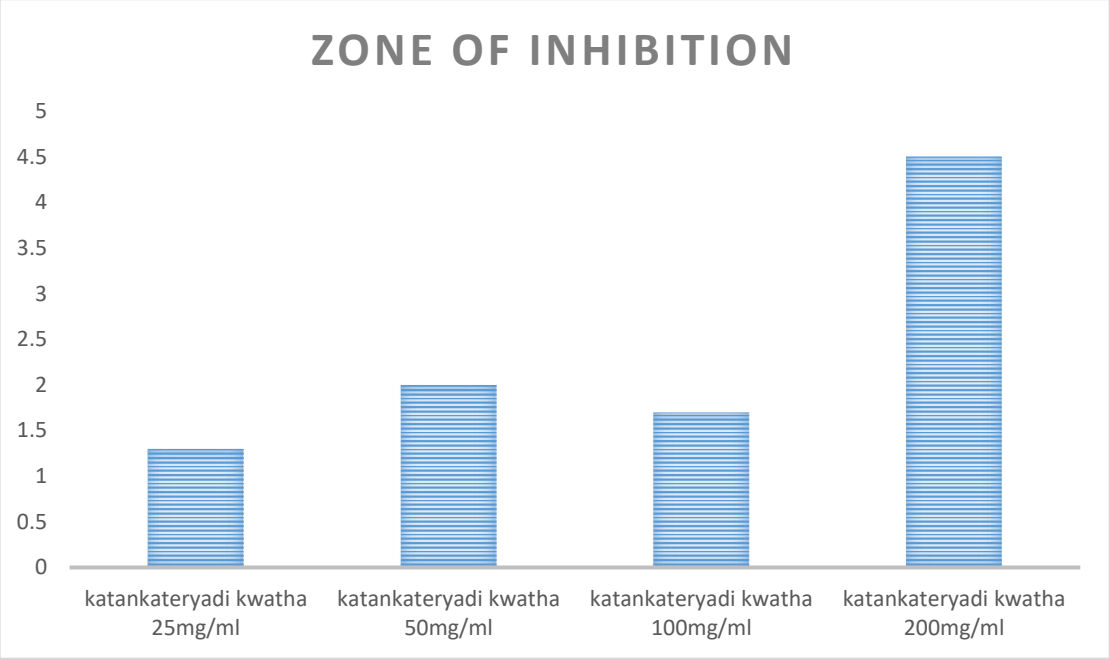
GRAM NEGATIVE BACTERIA

SN	KATANKATERYADI KWATHA(MG/ML)	ZONE OF INHIBITION(cm)
1-	25	1.1
2-	50	1.5
3-	100	1.9
4-	200	2.6



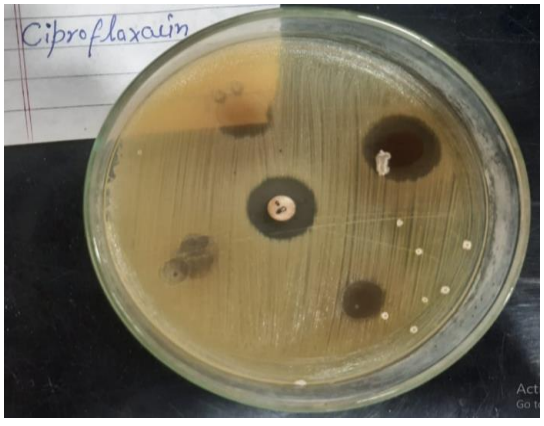
GRAM POSITIVE BACTERIA

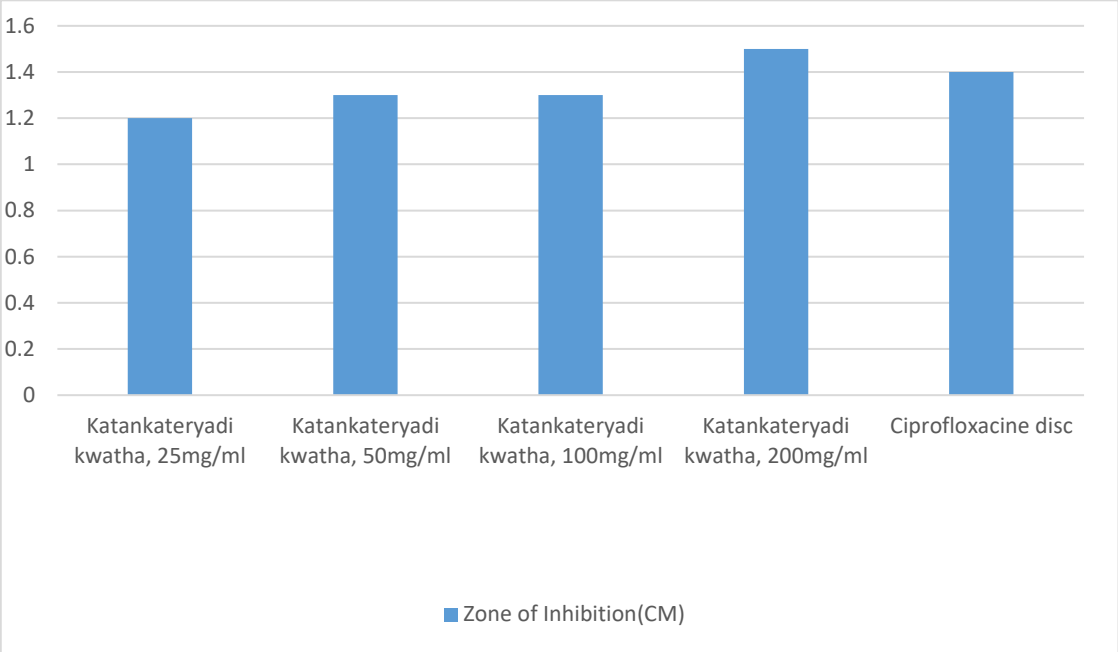
SN	KATANKATERYADI KWATHA(MG/ML)	ZONE OF INHIBITION(cm)
1-	25	1.3
2-	50	2
3-	100	1.7
4-	200	2.5



TESTING OF KATANKATERYADI KWATHA ON ATCC BACTERIAL STRAINS

SN	Katankateryadi kwatha (mg/ml)	Zone of Inhibition(cm)
1	25	1.2
2	50	1.3
3	100	1.3
4	200	1.5
5	Ciprofloxacin 20mg	1.4





If we are checking the antibacterial activity on ATCC bacterial strain then it shows good activity and maximum zone of inhibition is 1.5cm at 200mg/ml concentration.

4. Results

The katankateryadi kwatha has antibacterial activity on both gram-positive and gram-negative bacteria, but if we focus on the zone of inhibition, we find that the kwatha has better activity on gram-negative bacteria, E. coli, and the zone of inhibition is maximum at 200 mg/ml. It also works on ATCC strains.

5. Discussion

If we are discussing this preparation, then it is the best compared to other drugs because it is a complete herbal preparation (kwatha) with no side effects. In India, there is a lot of antimicrobial activity performed on herbal preparations, but this is a totally different preparation. If we are discussing the activity of this Kwatha on the ATCC strain, it will give the best result. If we are comparing it with erythromycin, then erythromycin does not work properly on this strain and shows a few zones of inhibition, but Kwatha gives the best result on this strain.

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