

EXPERIMENTAL STUDY OF HARITAKYADI KWATH IN PITTAJA MUTRA-KRICHHA (UTI IN PREGNANCY)

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ABSTRACT

Ayurveda is referred to as a holistic system of medicine and has been integrated in general wellness applications in several countries. It deals with managing health by maintaining equilibrium of physiological constituents.

Pittaj Mutrakrichha is one of the diseases caused due to *Mutravaha Srotodushti* i.e equivalent to UTI. Symptoms like dysuria, burning micturition and increased frequency of micturition are seen. **Cases of UTI in pregnancy are generally asymptomatic.** *E. coli* is the offending organism in over 90% cases. The incidence during pregnancy ranges from 2-10%, other pathogens include *Enterococcus*, *Proteus mirabilis*, *Klebsiella pneumoniae* and also fungi, yeasts and viruses. Bacteriuria is typically present at the time of the first prenatal visit, and if an initial positive urine culture is treated, less than 1% of women develop urinary infection.

The topic i.e., antimicrobial effect of *Haritakyadi Kwath* was assessed *in-vitro* against most common microbial agents associated with UTI.

I attempted the experimental study on *Pittaja Mutrakrichha* with herbal preparation named “*Haritakyadi Kwath*”. Experimental study was carried on 2 different characterised strain of bacteria (*E. coli*, *Enterococcus faecalis*) and characterised strain of yeast (*Candida albicans*).

Haritakyadi Kwath has been chosen to see the effect on the patients of *Pittaja Mutrakrichha* (UTI in pregnancy). *Haritakyadi Kwath* consists of 5 constituents namely *Haritaki*, *gokshur*, *amaltash*, *pashanbhed* and *yavasa*.

On the basis of experimental study, it can be concluded that *Haritakyadi kwath* is efficient in producing significant improvement in *Pittaja Mutrakrichha*.

Keywords: UTI, Pittaj Mutkrichha, Haritakyadi Kwath, Ayurveda.

INTRODUCTION

UTI is mostly a bacterial infectious disease; the medicines available in the market tend to alleviate the symptoms only. Many of them fails to kill the microbes adhered to the surface of the urinary tract forming biofilm (any group of microorganisms stuck together). Because of which the disease is recurrent. Therefore, in this study taking into all the consideration, *Haritakyadi Kwath* had been chosen to see the effect on the pregnant patients of *Pittaja Mutrakrichha* (UTIs). In addition, an experimental study was planned to evaluate the microbial effect of the herbal formulation (*Haritakyadi Kwath*) and also all the ingredients of *Haritakyadi Kwath* separately.

All the mentioned reasons have been my major motivation to choose UTIs as my research topic. The prime intention of the research is to review the concept of *Mutrakrichha* in *Ayurvedic* and modern aspects. Then, to re-introduce a safe, cost effective and efficacious *Ayurvedic* herbal formulation.

I attempted the experimental study on *Pittaja Mutrakrichha* with herbal preparation named “*Haritakyadi Kwath*” which is mentioned on *Chakradatta*. An experimental study was carried on 2 different characterised strain of bacteria (*E. coli*, *Enterococcus faecalis*) and characterised strain of yeast (*Candida albicans*).

Table 01: Name of drug – *Haritakyadi Kwath*

S. No	Constituents of <i>Haritakyadi Kwath</i>	Botanical name	Family	Part used	Proportion
1.	<i>Haritaki</i>	<i>Terminalia chebula</i> Retz.	Combretaceae	Pericarp of Fruit	1 part
2.	<i>Gokshura</i>	<i>Tribulus terrestris</i> Linn.	Zygophyllaceae	Fruit	1 part
3.	<i>Aragvadha</i>	<i>Cassia fistula</i> Linn.	Fabaceae	Fruit Pulp	1 part
4.	<i>Pashanabheda</i>	<i>Bergenia lingulata</i> (Wall.) (Engl.)	Saxifragaceae	Root	1 part

Aims and Objectives: -

- ❖ To evaluate the efficacy of *Haritakyadi kwath* in-vitro.

Antimicrobial study of research work consisted of:

1. Identification of microorganisms
2. Preparation of extract (aqueous and alcoholic)
3. Antimicrobial activity of extracts of *Haritakyadi Kwath* and its individual ingredients against different microorganisms associated with UTIs.
4. Observations
5. Results

a) Solid media used in the study:

- Nutrient agar (NA)
- Mac Conkey's Lactose Agar (MLA)

- Blood agar base (BA)

- Mueller Hinton Agar (MHA)

The commercial media was prepared according to the directions mentioned by the manufacturer.

b) Liquid Media:

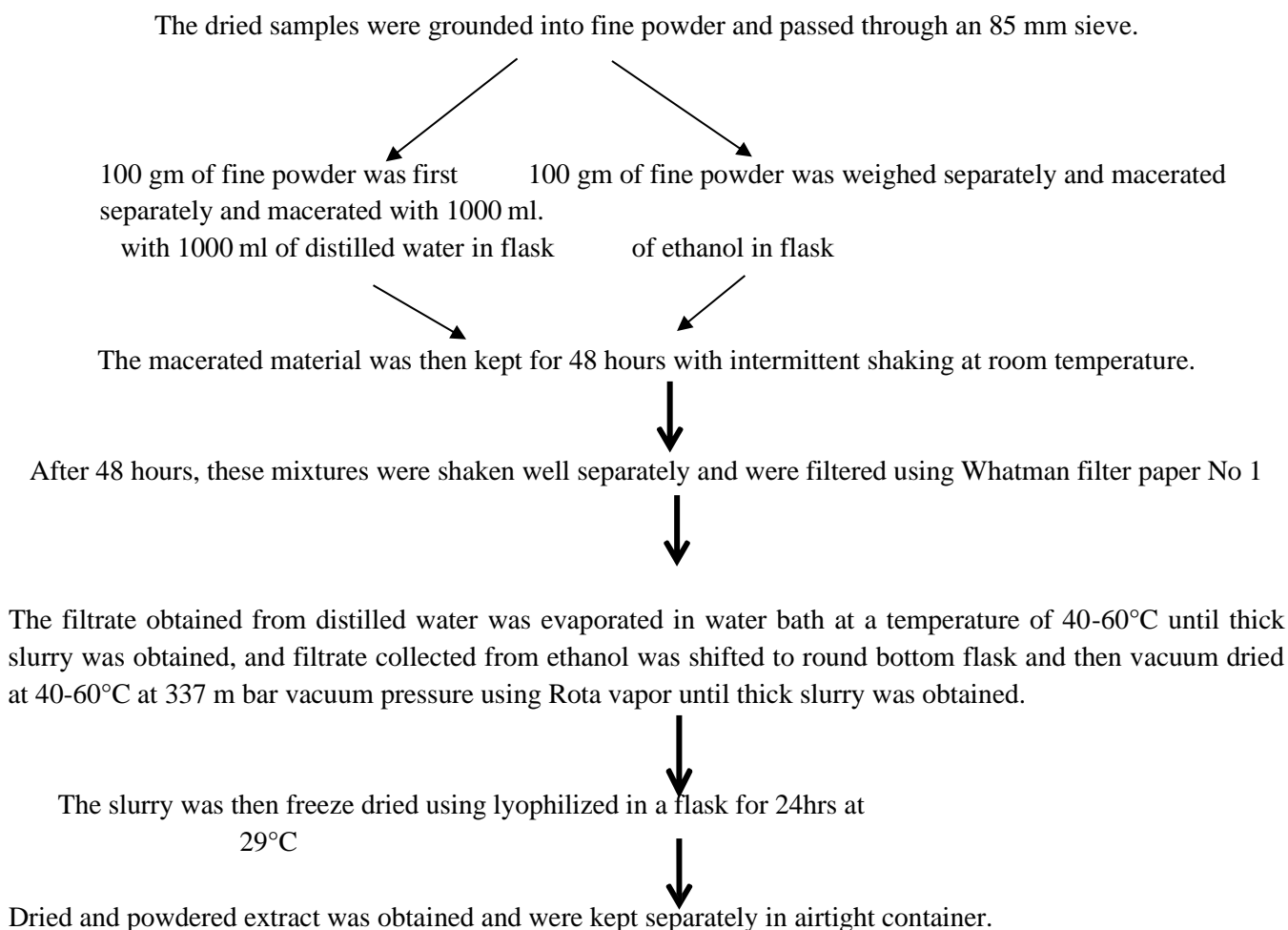
- **Nutrient Broth** – it is an example of a simple medium. It contains peptone water and meat extract 1%. When glucose (0.5%) is added to nutrient broth it becomes glucose broth¹¹.

Reagents:

- Reagent for gram staining like crystal violet, 95% ethyl alcohol, Gram's iodine and safranin

1. Preparation of extracts of samples:

Flow chart showing preparation of plant extract¹².



3. Preparation of plant extracts for use in:

Solubility of drug extract: Aqueous extracts and ethanolic extracts of *Haritakyadi Kwath* (whole drug) and its individual components were separately mixed with Distilled water (DW) at different concentrations. Selection of minimum concentrations of the drug: Minimum concentration of drug was selected by starting the concentration of extract from 250 mg/ml (25% conc.), then 500 mg/ml (50% conc.) and at last 1000 mg/ml (100% conc.). Different Zones of Inhibition were observed in the study.

Assessment of inhibition of microbial growth: The antibacterial activity of different samples of *Haritakyadi kwath* was studied *in vitro*. The zones of inhibi-

tion were recorded as the diameter of the growth free zones measured in mm and compared with positive control i.e., standard drug taken Norflox 5mcg and negative control as sterile distilled water.

Preparation of bacterial culture for AMST (Anti-microbial Sensitivity test):

The bacterial culture of *E. coli*, *Enterococcus faecalis*, and yeast *Candida albicans* was prepared in nutrient broth and turbidity was adjusted to 0.5 Mc Farland standard to yield approximately 1×10^8 colony forming units (cfu) per ml. The microbial suspension was then streaked over Mueller Hinton Agar (MHA). Inoculations of plates were done gently with the help of a sterile cotton swab. Each sterilized absorbent cotton

swab was soaked in respective broth culture and then the entire surface of the medium was carefully swabbed to ensure confluent growth of organisms. Plates were then allowed to dry for 5 minutes.

Agar Well Diffusion Method¹³

By using this method, wells with a diameter of 6 – 8mm were punched aseptically with a sterile tip and a volume of 50-100µl and well's surface was sealed with MHA. Then extract solution at desired concentration was introduced into each well. Then the agar plates were incubated at 37°C in a bacteriological incubator for 24 hours. After incubation, the zones of inhibition were recorded as the diameter of the growth free zones measured by scale.

Assessment of antimicrobial action of *Haritakyadi kwath* and its individual constituents against different microorganisms:

Aqueous extract of *Haritakyadi kwath* (whole drug) and its individual constituents were tested *in-vitro* for

antimicrobial action by using 25% conc. 50% conc. and 100% conc. Assessment of antimicrobial action was done by measuring the zone of inhibition (ZOI) of the extract of *Haritakyadi kwath* (whole drug) and its individual constituents and compared to the zone of inhibition of standard drug/positive control Norfloxacin 5mcg and negative control sterile distilled water. Similarly, alcoholic extract of *Haritakyadi kwath* (whole drug) and its individual constituents were tested *in-vitro* for antimicrobial action. Assessment of antimicrobial action was done by measuring the zone of inhibition of the extract of *Haritakyadi kwath* (whole drug) and its individual constituents and compared to the zone of inhibition of standard drug/positive control Norfloxacin 5mcg and negative control sterile distilled water.

Table 02: Table showing: ZOI of 25% concentration of aqueous *Haritakyadi Kwath* against different microbes taken in the study:

S. No.	Type of Aqueous Extract (in 25% Concentration)	<i>E. coli</i>	<i>Enterococcus faecalis</i>	<i>Candida albicans</i>
1.	<i>Haritakyadi Kwath</i>	22mm	16 mm	26 mm
2.	Positive control (Nox.)	37 mm	30 mm	35 mm
3.	Negative control (DW)	No ZOI	No ZOI	No ZOI

Table 03: Table showing: ZOI of 25% concentration of aqueous *Haritakyadi Kwath* ingredients against different microbes taken in the study:

S. No.	Type of Aqueous Extract (in 25% Concentration)	<i>E. coli</i>	<i>Enterococcus faecalis</i>	<i>Candida albicans</i>
1.	<i>Tribulus terrestris</i> Linn.	No ZOI	No ZOI	13 mm
2.	<i>Cassia fistula</i> Linn.	12 mm	10 mm	20 mm
3.	<i>Terminalia chebula</i> Retz.	32 mm	14 mm	27 mm
4.	<i>Fagonia cretica</i> Linn.	28mm	14mm	21 mm
5.	<i>Bergenia lingulata</i> (Wall.) (Engl.)	19 mm	23 mm	21 mm
6.	Positive control	37 mm	30 mm	35 mm
7.	Negative control	No ZOI	No ZOI	No ZOI

Table 04: Table showing: ZOI of 25% concentration of alcoholic *Haritakyadi Kwath* against different microbes taken in the study:

S. No.	Type of alcoholic Extract (in 25% Concentration)	<i>E. coli</i>	<i>Enterococcus faecalis</i>	<i>Candida albicans</i>
1.	<i>Haritakyadi Kwath</i>	No ZOI	22 mm	30 mm

2.	Positive control	37 mm	30 mm	35 mm
3.	Negative control	NO ZOI	NO ZOI	NO ZOI

Table 05: Table showing: ZOI of 25% concentration of alcoholic Haritakyadi Kwath ingredients against different microbes taken in the study:

S. No.	Type of alcoholic Extract (in 25% Concentration)	<i>E. coli</i>	<i>Enterococcus faecalis</i>	<i>Candida albicans</i>
1.	<i>Tribulus terrestris</i> Linn.	NO ZOI	NO ZOI	NO ZOI
2.	<i>Cassia fistula</i> Linn.	NO ZOI	20 mm	22 mm
3.	<i>Terminalia chebula</i> Retz.	NO ZOI	22 mm	32 mm
4.	<i>Fagonia cretica</i> Linn.	NO ZOI	20 mm	28 mm
5.	<i>Bergenia lingulata</i> (Wall.) (Engl.)	NO ZOI	20 mm	20 mm
6.	Positive control	37 mm	30 mm	35 mm
7.	Negative control	NO ZOI	NO ZOI	NO ZOI

Table 06: Table showing: ZOI of 50% concentration of Aqueous Haritakyadi Kwath against different microbes taken in the study:

S. No.	Type of Aqueous Extract (in 50% Concentration)	<i>E. coli</i>	<i>Enterococcus faecalis</i>	<i>Candida albicans</i>
1.	Haritakyadi Kwath	37 mm	23 mm	28 mm
2.	Positive control	37 mm	30 mm	35 mm
3.	Negative control	NO ZOI	NO ZOI	NO ZOI

Table 07: Table showing: ZOI of 50% concentration of Aqueous Haritakyadi Kwath ingredients against different microbes taken in the study:

S. No.	Type of Aqueous Extract (in 50% Concentration)	<i>E. coli</i>	<i>Enterococcus faecalis</i>	<i>Candida albicans</i>
1.	<i>Tribulus terrestris</i> Linn.	17 mm	NO ZOI	12 mm
2.	<i>Cassia fistula</i> Linn.	30 mm	20 mm	22 mm
3.	<i>Terminalia chebula</i> Retz.	35 mm	27 mm	32 mm
4.	<i>Fagonia cretica</i> Linn.	37 mm	22 mm	26 mm
5.	<i>Bergenia lingulata</i> (Wall.) (Engl.)	20 mm	20 mm	23 mm
6.	Positive control	37 mm	30 mm	35 mm
7.	Negative control	NO ZOI	NO ZOI	NO ZOI

Table 08: Table showing: ZOI of 50% concentration of Alcoholic Haritakyadi Kwath against different microbes taken in the study:

S. No.	Type of Alcoholic Extract (in 50% Concentration)	<i>E. coli</i>	<i>Enterococcus faecalis</i>	<i>Candida albicans</i>
1.	Haritakyadi Kwath	15 mm	15 mm	27 mm
2.	Positive control	37 mm	30 mm	35 mm
3.	Negative control	NO ZOI	NO ZOI	NO ZOI

Table 09: Table showing: ZOI of 50% concentration of Alcoholic Haritakyadi Kwath ingredients against different microbes taken in the study:

S. No.	Type of Alcoholic Extract (in 50%)	<i>E. coli</i>	<i>Enterococcus faecalis</i>	<i>Candida albicans</i>
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	Concentration)			
1.	<i>Tribulus terrestris</i> Linn.	NO ZOI	15 mm	NO ZOI
2.	<i>Cassia fistula</i> Linn.	21 mm	16 mm	20 mm
3.	<i>Terminalia chebula</i> Retz.	20 mm	17 mm	29 mm
4.	<i>Fagonia cretica</i> Linn.	21 mm	18 mm	27 mm
5.	<i>Bergenia lingulata</i> (Wall.) (Engl.)	NO ZOI	NO ZOI	20 mm
6.	Positive control	37 mm	30 mm	35 mm
7.	Negative control	NO ZOI	NO ZOI	NO ZOI

Table 10: Table showing: ZOI of 100% concentration of Aqueous *Haritakyadi Kwath* against different microbes taken in the study:

S. No.	Type of Aqueous Extract (in 100% Concentration)	<i>E. coli</i>	<i>Enterococcus faecalis</i>	<i>Candida albicans</i>
1.	<i>Haritakyadi Kwath</i>	37 mm	16 mm	26 mm
2.	Positive control	37 mm	30 mm	35 mm
3.	Negative control	NO ZOI	NO ZOI	NO ZOI

Table 11: Table showing: ZOI of 100% concentration of Aqueous *Haritakyadi Kwath* ingredients against different microbes taken in the study:

S. No.	Type of Aqueous Extract (in 100% Concentration)	<i>E. coli</i>	<i>Enterococcus faecalis</i>	<i>Candida albicans</i>
1.	<i>Tribulus terrestris</i> Linn.	17 mm	NO ZOI	14 mm
2.	<i>Cassia fistula</i> Linn.	26 mm	17 mm	22 mm
3.	<i>Terminalia chebula</i> Retz.	38 mm	27 mm	30 mm
4.	<i>Fagonia cretica</i> Linn.	35 mm	15 mm	29 mm
5.	<i>Bergenia lingulata</i> (Wall.) (Engl.)	26 mm	17 mm	27 mm
6.	Positive control	37 mm	30 mm	35 mm
7.	Negative control	NO ZOI	NO ZOI	NO ZOI

Table 12: Table showing: ZOI of 100% concentration of Alcoholic *Haritakyadi Kwath* against different microbes taken in the study.

S. No.	Type of Alcoholic Extract (in 100% Concentration)	<i>E. coli</i>	<i>Enterococcus faecalis</i>	<i>Candida albicans</i>
1.	<i>Haritakyadi Kwath</i>	16 mm	18 mm	25 mm
2.	Positive control	37 mm	30 mm	35 mm
3.	Negative control	NO ZOI	NO ZOI	NO ZOI

Table 13: Table showing: ZOI of 100% concentration of Alcoholic *Haritakyadi Kwath* ingredients against different microbes taken in the study:

S. No.	Type of Alcoholic Extract (in 100% Concentration)	<i>E. coli</i>	<i>Enterococcus faecalis</i>	<i>Candida albicans</i>
1.	<i>Tribulus terrestris</i> Linn.	10 mm	12 mm	10 mm
2.	<i>Cassia fistula</i> Linn.	22 mm	18 mm	20 mm
3.	<i>Terminalia chebula</i> Retz.	32 mm	25 mm	32 mm
4.	<i>Fagonia cretica</i> Linn.	25 mm	17 mm	27 mm
5.	<i>Bergenia lingulata</i> (Wall.) (Engl.)	24 mm	15 mm	27 mm

6.	Positive control	37 mm	30 mm	35 mm
7.	Negative control	NO ZOI	NO ZOI	NO ZOI

- Distilled water (DW) - as negative control
- Norfloxacin 5 mcg - as standard drug/Positive control
Standard sensitivity of Norfloxacin 5mcg against *E. coli* is 28-35 mm and against *E. faecalis* is 17-28 mm (Hitch standard table)
- Sensitive: >16mm, Intermediate: 11-15 and Resistant: <10

4. OBSERVATIONS

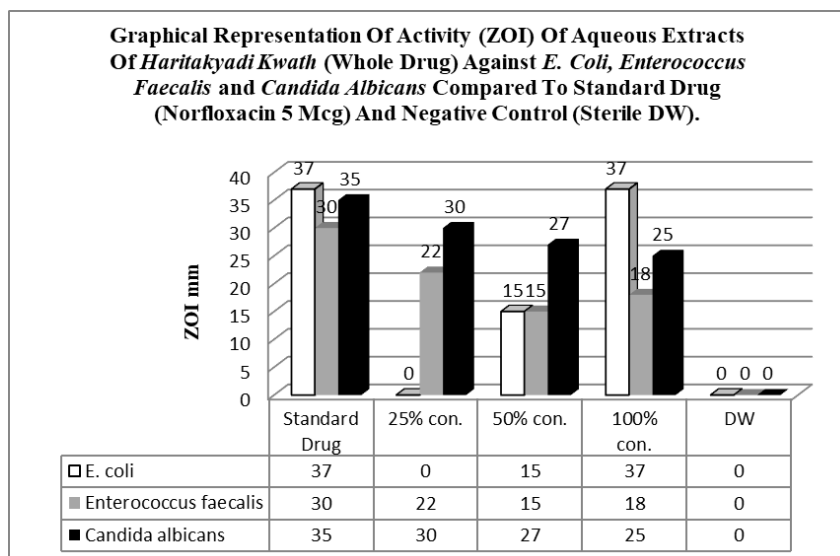
The study of antimicrobial activity of *Haritakyadi Kwath* (whole drug) and its individual ingredients against UTI causing pathogens was performed in study. It was found that both aqueous and alcoholic extract of *Haritakyadi Kwath* (whole drug) and its individual ingredients exhibited antimicrobial activity

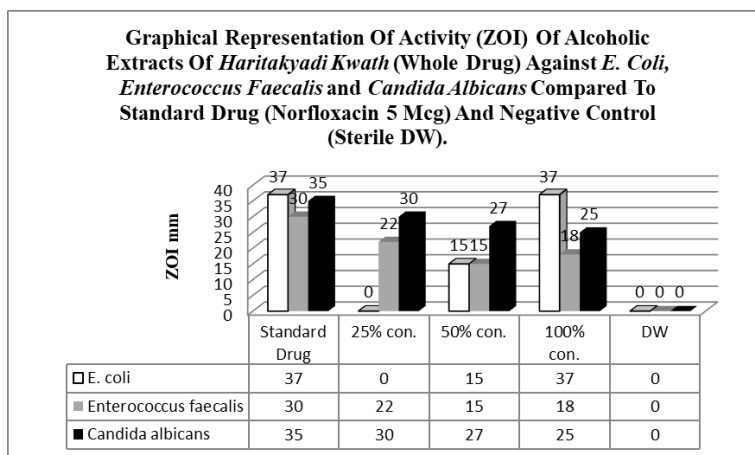
towards *E. coli*, *Enterococcus faecalis*, and *Candida albicans* with various degrees of inhibition. Three different concentrations of the extracts were used for testing the antibacterial efficacy. Antibacterial activities of *Haritakyadi Kwath* (whole drug) and its different constituents at different concentrations i.e., 250 mg, 500 mg and 1000 mg were observed. The diameter of growth inhibition area extracts varied from no ZOI to 38 mm.

Among these 500 mg/ml i.e. (50% conc.) was selected as standard because it is the lowest concentration at which adequate zone of inhibition was observed against most of the microorganism strains used in the study.

1. Graphical representation of activity (ZOI) of aqueous extracts of *Haritakyadi Kwath* (whole drug) against *E. coli*, *Enterococcus faecalis* and *Candida albicans* compared to standard drug (Norfloxacin 5 mcg) and negative control (sterile DW).

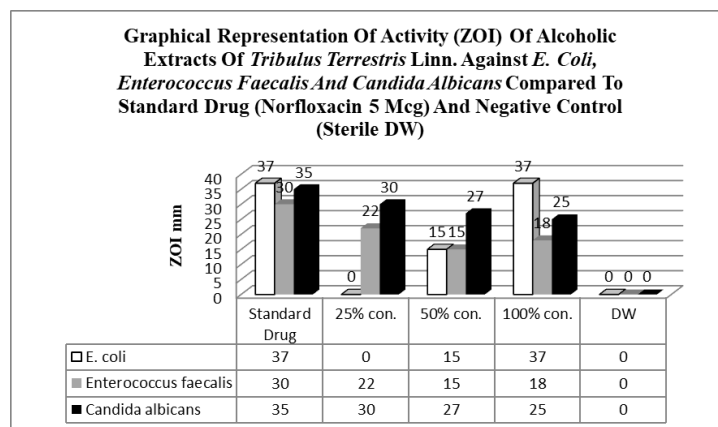
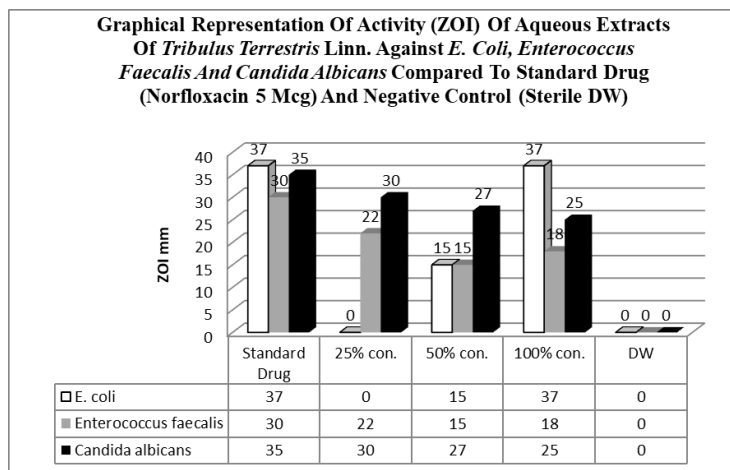
The antimicrobial activity of aqueous extract (50% concentration) of *Haritakyadi Kwath* (whole drug) showed maximum (37 mm) against *E. coli*, 23 mm against *Enterococcus faecalis* and 28 mm against *Candida albicans*. This also shows a decrease in pattern of the antibacterial activity of other extract with the decreasing pattern of concentration of extract used.





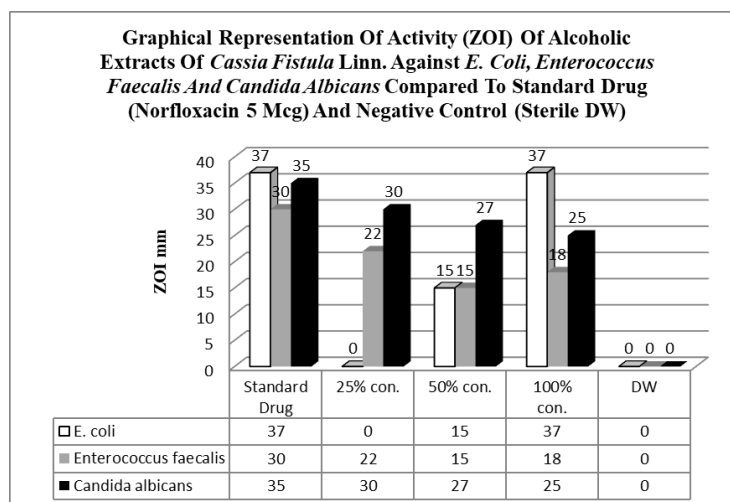
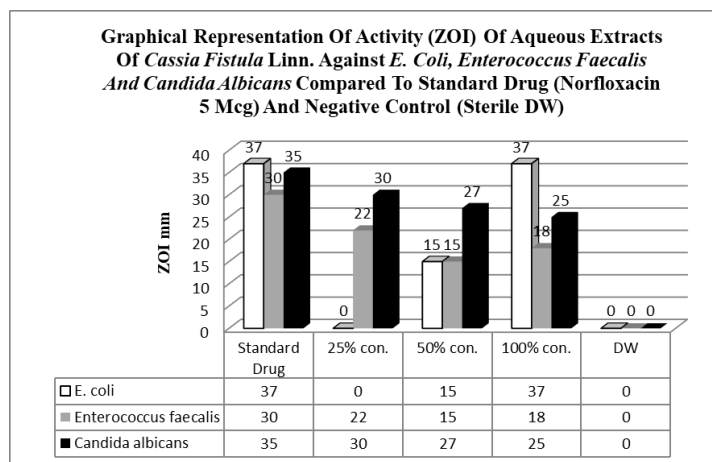
2. Graphical representation of activity (ZOI) of aqueous extracts of Tribulus terrestris Linn. against E. coli, Enterococcus faecalis and Candida albicans compared to standard drug (Norfloxacin 5 mcg) and negative control (sterile DW).

The antimicrobial activity of aqueous extract (50% concentration) of *Tribulus terrestris* Linn. showed maximum (17 mm) for *E. coli*, No ZOI were observed for *Enterococcus faecalis*, whereas 12 mm against *Candida albicans*. This also shows a decrease in pattern of the antibacterial activity of other extract with the decreasing pattern of concentration of extract used.



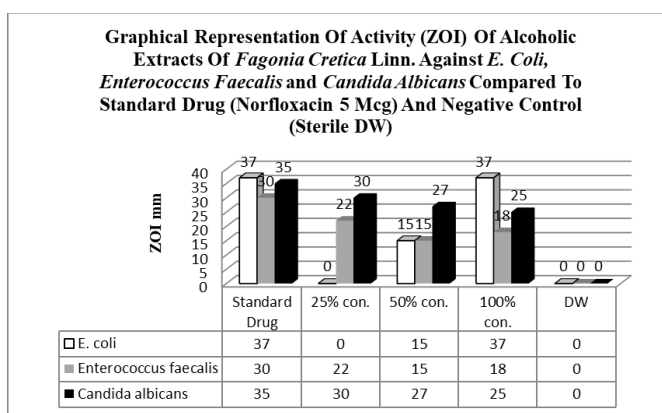
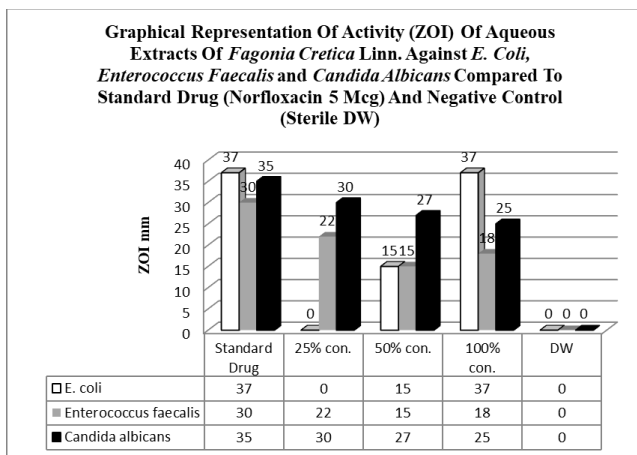
3. Graphical representation of activity (ZOI) of aqueous extracts of *Cassia fistula* Linn. against *E. coli*, *Enterococcus faecalis* and *Candida albicans* compared to standard drug (Norfloxacin 5 mcg) and negative control (sterile DW).

The antimicrobial activity of aqueous extract (50% concentration) of *Cassia fistula* Linn. showed maximum (30 mm) against *E. coli*, 20 mm against *Enterococcus faecalis*, and 22 mm against *Candida albicans*. This also shows a decrease in pattern of the antibacterial activity of other extract with the decreasing pattern of concentration of extract used.



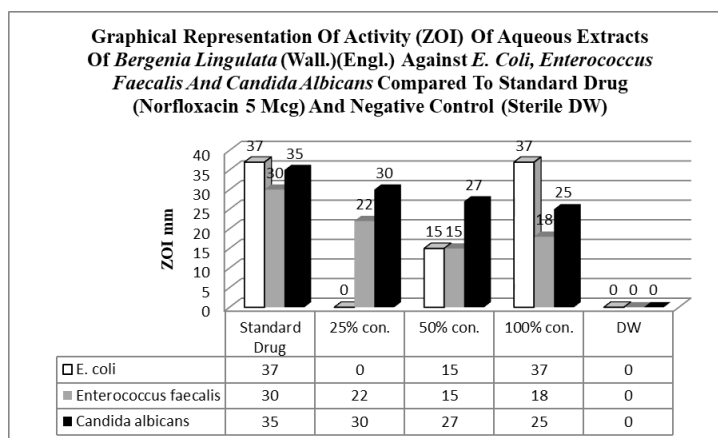
4. Graphical representation of activity (ZOI) of aqueous extracts of *Fagonia cretica* Linn. against *E. coli*, *Enterococcus faecalis* and *Candida albicans* compared to standard drug (Norfloxacin 5 mcg) and negative control (sterile DW).

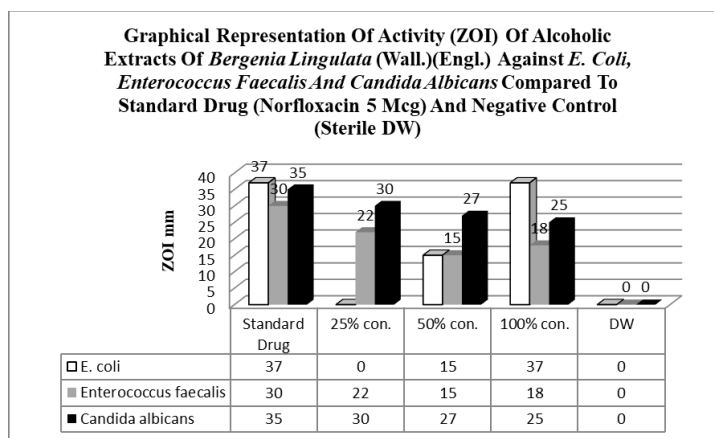
The antimicrobial activity of aqueous extract (50% concentration) of *Fagonia cretica* Linn. showed maximum (37 mm) against *E. coli*, 22 mm against *Enterococcus faecalis*, 26 mm against *Candida albicans*. This also shows a decrease in pattern of the antibacterial activity of other extract with the decreasing pattern of concentration of extract used.



5. Graphical representation of activity (ZOI) of aqueous extracts of *Bergenia lingulata* (Wall.) (Engl.) against *E. coli*, *Enterococcus faecalis* and *Candida albicans* compared to standard drug (Norfloxacin 5 mcg) and negative control (sterile DW).

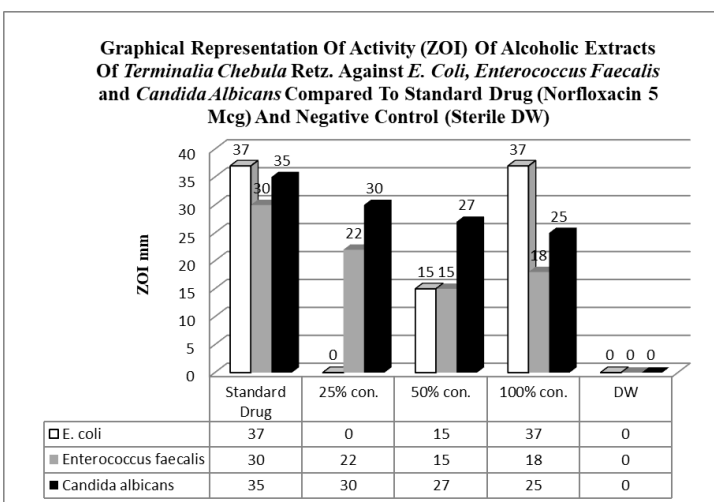
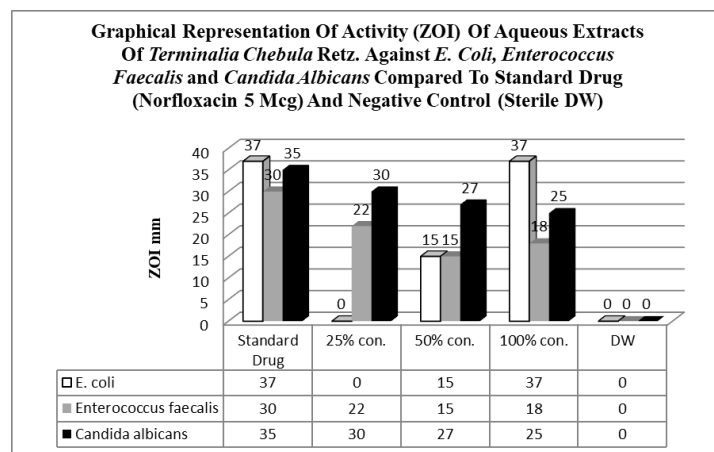
The antimicrobial activity of aqueous extract (50% concentration) of *Bergenia lingulata* (Wall.) (Engl.) showed maximum 23 mm for *Candida albicans*, 20 mm against *E. coli* and 20 mm against *Enterococcus faecalis*, this also shows a decrease in pattern of the antibacterial activity of other extract with the decreasing pattern of concentration of extract used.





6. Graphical representation of activity (ZOI) of aqueous extracts of *Terminalia chebula* Retz. against *E. coli*, *Enterococcus faecalis* and *Candida albicans* compared to standard drug (Norfloxacin 5 mcg) and negative control (sterile DW).

The antimicrobial activity of aqueous extract (50% concentration) of *Terminalia chebula* Retz. showed maximum (35 mm) for *E. coli*, 27 mm against *Enterococcus faecalis*, 32 mm against *Candida albicans*. This also shows a decrease in pattern of the antibacterial activity of other extract with the decreasing pattern of concentration of extract used.



DISCUSSION

The present study had been carried out to rule out the antimicrobial activity of *Haritakyadi Kwath* against common pathogenic bacteria causing UTIs. Bacterial species which are mostly responsible for UTI in pregnancy is gram negative bacilli i.e *Escherichia coli* and gram-positive cocci i.e *Enterococcus faecalis* and yeast *Candida albicans*. These pathogens were procured from Microbial Type Culture Collection (MTCC) and Gene bank, Institute of Microbial technology (iMTech), Chandigarh, and experimental study done in Microbiology Laboratory of Department of Veterinary Microbiology, DGCN College Of Veterinary and Animal Sciences, DGCN COVAS, HPKV, Palampur, Distt. Kangra, H.P.

Antimicrobial action of aqueous extract of *Haritakyadi Kwath* and its individual constituents:

- Aqueous extract (50% concentration) of *Haritakyadi Kwath* observed maximum (37 mm) for *E. coli*, 23 mm for *Enterococcus faecalis*, 28 mm for *Candida albicans* comparable to standard (Norfloxacin 5 mcg).
 - Aqueous extract (50% concentration) of *Tribulus terrestris* Linn. observed maximum (17 mm) for *E. coli*, NO ZOI for *Enterococcus faecalis*, 12 mm for *Candida albicans* comparable to standard (Norfloxacin 5 mcg).
 - Aqueous extract (50% concentration) of *Cassia fistula* Linn. observed maximum (30 mm) for *E. coli*, 20 mm for *Enterococcus faecalis*, 22 mm for *Candida albicans* comparable to standard (Norfloxacin 5 mcg).
 - Aqueous extract (50% concentration) of *Terminalia chebula* Linn. observed maximum (35 mm) for *E. coli*, 27 mm for *Enterococcus faecalis*, 32 mm for *Candida albicans* comparable to standard (Norfloxacin 5 mcg).
 - Aqueous extract (50% concentration) of *Fagonia cretica* Linn. observed maximum (37 mm) for *E. coli*, 22 mm for *Enterococcus faecalis*, 26 mm for *Candida albicans* comparable to standard (Norfloxacin 5 mcg).
- Aqueous extract (50% concentration) of *Bergenia lingulata* Linn. observed maximum (20 mm) for *E. coli*, 20 mm for *Enterococcus faecalis*, 23 mm for *Candida albicans* comparable to standard (Norfloxacin 5 mcg).

Antimicrobial action of alcoholic extract of *Haritakyadi Kwath* and its individual constituents:

- Alcoholic extract (50% concentration) of *Haritakyadi Kwath* observed maximum (27 mm) for *Candida albicans*, 15 mm for *Enterococcus faecalis*, 15 mm for *E. coli* comparable to standard (Norfloxacin 5 mcg).
- Alcoholic extract (50% concentration) of *Tribulus terrestris* Linn. observed maximum (15 mm) for *Enterococcus faecalis*, NO ZOI for *E. coli* and *Candida albicans* comparable to standard (Norfloxacin 5 mcg).
- Alcoholic extract (50% concentration) of *Cassia fistula* Linn. observed maximum (21 mm) for *E. coli*, 16 mm for *Enterococcus faecalis*, 20 mm for *Candida albicans* comparable to standard (Norfloxacin 5 mcg).
- Alcoholic extract (50% concentration) of *Terminalia chebula* Linn. maximum (32 mm) for *E. coli*, 29 mm for *Enterococcus faecalis*, 27 mm for *Candida albicans* comparable to standard (Norfloxacin 5 mcg).
- Alcoholic extract (50% concentration) of *Fagonia cretica* Linn. observed maximum (27 mm) for *Candida albicans*, 21 mm for *E. coli*, 18 mm for *Enterococcus faecalis* comparable to standard (Norfloxacin 5 mcg).
- Alcoholic extract (50% concentration) of *Bergenia lingulata* Linn. observed maximum (20 mm) for *Candida albicans*, No ZOI for *Enterococcus faecalis* and *E. coli* comparable to standard (Norfloxacin 5 mcg).

Results showed a maximum antimicrobial activity of aqueous extract (50% conc.) of *Haritakyadi Kwath* and its individual constituents against *E. coli*, *Enterococcus faecalis* and *Candida albicans* as compared to other concentrations. Saponins, alkaloids, flavonoids, tannins, steroids, arginine, barbaloin, phenolic com-

pounds, terpenoids, coumarins and terpenes are the chemical constituents present in the trial drug. The reason behind having a satisfactory antimicrobial study may be because of the above chemical constituents present in the drug.

Note - UTI and vulvovaginal candidiasis both occur frequently in women. Although candidiasis is believed to commonly occur after antibiotic therapy. So, *Candida albicans* was taken in this study. The positive control (Norfloxacin) which was taken for the study also showed ZOI (35mm) against *Candida albican* although the positive control has antibacterial action but still showed action against fungi.

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