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A PRELIMINARY ANTIMICROBIAL STUDY ON *PARPATADYARISHTA*

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ABSTRACT

The antimicrobial activity of a drug is generally expressed as its inhibiting effect towards the growth of bacteria in nutrient broth or nutrient agar medium. Antimicrobial activity of *Parpatadyarishta* was tested by the Agar Well Diffusion Method.

KEYWORDS: *Parpatadyarishta, Salmonella typhi, Esch.coli, Candidia albicans,* Agar well diffusion method.

INTRODUCTION

Nature has been the source of medicinal agents since the time immortal. The importance of herbs in the management of human ailments cannot be overemphasized. Various medicinal properties have been attributed to natural herbs. The use of traditional medicine is widespread in India. Ayurvedic system of treatments has been estimated to meet 70-80% of health care needs of India. These herbal remedies are an important source for the discovery of new antimicrobials against the resistant strains of bacteria.

There are many fermented preparations mentioned in Ayurvedic pharmaceutics since ancient times. These are known as *Sandhana Kalpas*[1] in Ayurveda. *Asavarishtas* are medicated self generated alcohol containing preparations which could be kept for longer period for preserving the properties of the drugs. The term *Arishta* used is an indicative of nature of these preparations. These are not deteriorated by passing of time as said in *Sharangadhara Samhita* while describing shelf life of various preparations that *Asavarishtas* retain their properties even after becoming older.

Parpatadyarishta is the formulation explained in the text *Sahasrayogam Arishta Prakarana.* The antimicrobial activity of the *Parpatadyrishta* was tested by Agar well diffusion method against standard cultures of *Escherichia coli, Salmonella typhimurium* and *Candidia albicans.* The ingredients such as *Guduchi, Chitraka, Maricha, Pippali, Dhataki, Vidanga, Musta, Kantakari, Chavya, Guda* and *Devadaru* are possessing *Krimighna* properties[2] and studies are proven that *Parpata* is having antimicrobial activity.[3] So to evaluate the Antimicrobial activity of the formulation *Parpatadyarishta*, this work was selected.

AIMS AND OBJECTIVES

The aim of the study was to find the antimicrobial property of *Parpatadyarishta* against *Salmonella typhi, E.coli* and *Candidia albicans.*

MATERIALS AND METHODS

The antibacterial study was carried out at the Biotechnology Department, Alva's Educational Foundation. The study was conducted between 17/11/2021 and 19/11/2021. The details of the study are given below.

- Test organisms- *Salmonella typhi, Esch.coli* and *Candidia albicans.*
- Sample – *Parpatadyarishta*
- Reagents – Agar media, Surgical spirit
- Equipments

1. Incubator
2. Borer
3. Pipette

Laminar air flow with flame

- Glass ware

1. Petri dish
2. Test tube
3. Stirrer

METHOD

Antimicrobial study was done by Agar well diffusion method.

Date of commencement: 17/11/2021

Date of completion: 19/11/2021

ANTI-BACTERIAL ACTIVITY

Test organisms

- *Salmonella typhi*
- *Esch.coli*

Preparation of inoculums

A loop full of culture was inoculated into nutrient broth and inoculated at 37˚C for 24 hours to obtain the bacterial cultures.

AGAR WELL DIFFUSION METHOD

Petri-dishes were taken with nutrient agar media[4] and allowed this to solidify for 30 minutes. The test organisms were spread on the surface of the media using sterile cotton swab. Cork borer (6mm) was used to bore wells in media. *Parpatadyarishta* with different concentration viz, 800, 900, 1000µl was dispended into the well using a micropipette respectively. A negative control of boiled and cooled pure water and a positive control of bacteria with different concentration viz, 10, 20µl were pipetted and the *Arishta* was allowed to diffuse for half an hour and the plates were incubated at 37˚C for 24 hours zone of inhibition was measured.

ANTI- FUNGAL ACTIVITY

Test organisms

- Yeast *Candidia* was cultured on yeast extract peptone dextrose (YEPD) broth incubated at 37˚C for 24 hours.

AGAR WELL DIFFUSION METHOD[5]

Yeast extract peptone dextrose agar (YEPDA) medium was used for well diffusion method of fungal culture. The test organism was spread on the surface of the media using sterile cotton swab. Cork borer (6mm) was used to bore wells in media. *Parpatadyarishta* with different concentration viz, 800, 900, 1000µl was dispended into the well using a micropipette. A negative control of boiled and cooled pure water and a positive control of 200µg/ml flucanazole were used.

Then the plate was incubated at 37˚C for 24 hours zone of inhibition was measured in millimetre.

OBSERVATION AND RESULTS

Antibacterial study

In-vitro antibacterial activity was evaluated using the agar well diffusion method. Nutrient agar was used as the medium.

The sterile agar was inoculated with the bacteria culture (*Salmonella typhi, Esch.coli*) for 24 hours at 37^0C. Wells were bored by using a sterile borer and *Parpatadyarishta* with different concentration were placed into them. Plates were kept for 2hours in the refrigerator to enable the pre-diffusion of *Arishta* into agar. The plates were incubated overnight (24hours) at 37^0C.

RESULTS

Based on the zone of inhibition seen in above experiment, the result is tabulated as follows in table no.1, 2 and 3;

Table no.1 Test organism: *Salmonella typhi*

SL.NO	Concentration of *Parpatadyarishta*	Zone diameter	Zone of inhibition	Zone of inhibition with standard drug
1	800µl	7mm	1mm	12mm (Penicillin)
2	900µl	14mm	8mm	
3	1000µl	24mm	18mm	

*diameter of cork borer – 6mm

The table no.1 represent that the formulation *Parpatadyarishta* had antibacterial activity against *Salmonella typhi*.

The study on *Salmonella typhimurium* shows more zone of inhibition at the concentration level of 1000µl. whereas comparatively less zone of inhibition at the concentration level of 800µl. This indicates that by increasing the concentration level, the action of *Parpatadyrishta* against *Salmonella typhi* also increases.

Table no. 2: Test organism: *Esch.coli*

SL.NO	Concentration of *Parpatadyarishta*	Zone diameter	Zone of inhibition	Zone of inhibition with standard drug
1	800µl	10mm	4mm	6mm (Penicillin)
2	900µl	12mm	6mm	
3	1000µl	18mm	12mm	

*diameter of cork borer – 6mm

The table no.2 represent that the formulation *Parpatadyarishta* had antibacterial activity against *Esch.coli.*

The study on *Esch.coli* shows more zone of inhibition at the concentration level of 1000µl. whereas comparatively less zone of inhibition at the concentration level of 800µl. This indicates that by increasing the concentration level, the action of *Parpatadyrishta* against *Esch.coli* also increases.

Antifungal study

Sterile Yeast extract peptone dextrose agar (YEPDA) medium was prepared and 0.1 ml of inoculums from the standardized culture of the test organism was spread uniformly. Wells were prepared by using a sterile borer of diameter 6mm. the *Parpatadyarishta* with different concentration were added in each well separately. The plates were placed for 2 hours in refrigerator to allow the diffusion of the *Arishta* into the medium. And the plates were incubated for 24 hours at 37^0C. The zone of inhibition around the well was measured in millimetres.

RESULT

Result is tabulated in table no.3.

Table no.3 Test organism: *Candidia albicans*

SL.NO	Concentration of *Parpatadyarishta*	Zone diameter	Zone of inhibition	Zone of inhibition with standard drug
1	800µl	9mm	3mm	16mm (Flucanazole)
2	900µl	10mm	4mm	
3	1000µl	13mm	7mm	

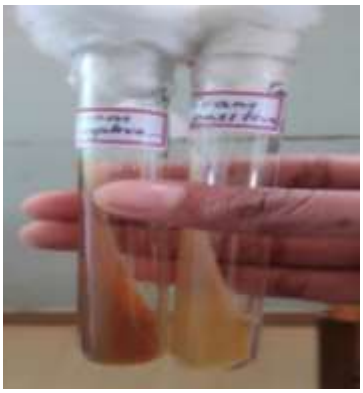
*diameter of cork borer – 6mm

The study on *Candidia albicans* shows more zone of inhibition at the concentration level of 1000µl. whereas comparatively less zone of inhibition at the concentration level of 800µl. This indicates that by increasing the concentration level, the action of *Parpatadyrishta* against *Candidia albicans* also increases.

The table represent that the formulation *Parpatadyarishta* had minimal antifungal activity against *Candidia albicans*.

Hence the study shows that *Parpatadyarishta* is having antimicrobial activity in which antibacterial effect is more compared with antifungal activity.

PHOTOGRAPHS



5.1 Test organisms

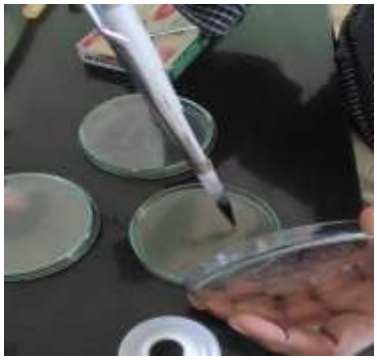
5.2 Petri-dishes

5.3 Pipette and cork borer

5.4 Fire source

5.5 Taking test organism from test tube

5.6 Spreading the test organisms



5.7 Pouring the *Parpatadyarishta* into the well

5.8 After pouring

5.9 *Salmonella typhi*

5.10 *Esch.coli*

5.11 *Candidia albicans*

DISCUSSION

Now-a-days one of the most common causes of disease and death is infections. In-order to combat different infections, several microbial source derived antibiotics are used. Use of several antibiotics cause hypersensitive reactions and it become ineffective when the infectious organism develops resistance against them. The quest for newer treatment continues with research in modern science expanding to ayurvedic preparations. This leads to an increased demand in Ayurveda to do research on already mentioned classical formulations for curing the ailments. Many of the drugs mentioned in our classics have more therapeutic efficacy, but they lack scientific validity regarding their mode of action, dosage and duration of the treatment to be adopted. Hence antimicrobial study proof of this will help mankind to use the medicine much efficaciously and it indicates its trustworthiness. The antimicrobial activity of a drug is generally expressed as its inhibitory effect towards the growth of bacterium in nutrient broth or nutrient agar.[6] Antimicrobial activity of *Parpatadyarishta* was tested by agar well diffusion method. This assay provides us with qualitative information. Boiled and cooled pure water was used as negative control instead of distilled water. Because $_{p}H$ of distilled water changes from 7 to 5.8 when contact with atmosphere. Water (H_2O) when contact with CO_2 will form carbonic acid (H_2CO_3). I.e. $_{p}H$ changes from neutral to acidic. The present study is proved that the sample drug *Parpatadyarishta* is having antimicrobial activity against *Salmonella typhi, Esch.coli, Candidia albicans*. By increasing the concentration of *Arishta*, the zone of inhibition also increases.

CONCLUSION

The formulation, *Parpatadyarishta* is mentioned in *Sahasrayoga Arishta Prakarana.* The present study was carried out to evaluate its antimicrobial activity against *Salmonella typhi, Esch.coli* and *Candidia albicans* by adopting agar well diffusion method.

Based on antimicrobial study results, it is seen that formulation *Parpatadyrishta* is having good antibacterial action against *Salmonella typhi*, *Esch.coli* and comparatively less antifungal action against *Candidia albicans*.

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