



WWW.IJAPC.COM

IJAPC

e ISSN 2350 0204

VOLUME 12 ISSUE 1 2020

GREENTREE GROUP PUBLISHERS (GGP)



Screening of Antimicrobial and Antifungal activity of *Gandhak Druti*

Mangala Jadhav^{1*} and Priyanka K Tayade²

¹⁻²Rasashastra and Bhaishajya Kalpana Dept., R. A. Podar Medical College (Ayu), Worli, Mumbai, Maharashtra, India

ABSTRACT

Gandhak is an important drug in *Rasashastra* used since ancient times. It is known for its best antimicrobial action and choice of drug for various disorder such as *kustha*, *kandu*, *twak vikaras* etc. *Gandhak Druti* is one of the unique preparation of *Rasoushadhi* (metallic and mineral preparation) mentioned in *Rasa Tarangini*, *Rasa Ratna Samucchay* and *Ayurved Prakash*. Objective-The present study was undertaken to evaluate Antimicrobial and Antifungal activity of *Gandhak Druti* against two bacteria *Staphylococcus aureus*, *Pseudomonas aeruginosa* and fungi *Candida albicans*. Method-*Gandhak druti* prepared according to the procedures mentioned in classics. Inhibition of microbial growth was investigated using diffusion method. Result-The data will be assessed for its antimicrobial and antifungal action. Conclusion-The result of this Research work will serve as effective quality tool for inhibition of skin disease by using *Gandhak Druti*.

KEYWORDS

Gandhak Druti, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Candida albicans*.



Greentree Group Publishers

Received 23/10/19 Accepted 19/12/19 Published 10/01/2020



INTRODUCTION

In ancient text number of *krimighna dravya* are explained. The word 'krimi' is compared to various type of micro-organism which include various bacteria and fungi etc. Bacteria are the most ancient organisms present till this date. They are unicellular, prokaryotic and having simple cell structure. Fungi are the multicellular eukaryotic organisms. They have complex cell structure¹.

Gandhak is most important drug and widely used for many diseases. *Rasashastra* classical text have mentioned about *Gandhak* is *Keetnashak*, *Keetaghna*, *Krumighna*, *Pamari*, *Kushtari*, *Dadrughna*. It shows its action on various diseases of skin. That's why this drug was chosen to check antimicrobial and antifungal action. Raw *Gandhak* causes some diseases in body as it contains impurities, that is *Shilachurna* and *Visha*. So it's necessary to do 'gandhak shodhan' process to get more benefits of *Shuddha Gandhak*².

Identification of disease causing agent (microbes) is highly essential hence *Gandhak Druti* was checked for its specific antimicrobial activity. The process which maintain hard and dense *dravyas* in the molten state is known as *Druti*. The details of *druti* have been mentioned in *Rasa Tarangini*, *Rasa Ratna Samuchhaya*, *Rasa*

Chudamani, *Ayurved Prakash*, *Rasa Hruday Tantra*, *Rasa Prakash Sudhakar*, *Rasarnava*. *Gandhak Druti* is used for treatment of *kshudra kustha*, *visarpa*, and *rakta dusthijanya vikara*³. Past studies have been done to study the antibacterial and antifungal activity of *Gandhak Rasayana* but no studies on *Gandhak* alone and on *Gandhak Druti*. Hence this study was done to know antimicrobial and antifungal activity of *Gandhak Druti*.

AIMS AND OBJECTIVES

AIM

To evaluate Antimicrobial and Antifungal activity of *Gandhak Druti*.

OBJECTIVES

- To carry out purification of the raw drug *Gandhak*
- To prepare *Gandhak Druti*
- To determine the Antimicrobial and Antifungal activity of prepared sample.

MATERIALS AND METHODS

MATERIAL

- *Gandhak*
- *Godugdha*
- *Goghрут*
- *Trikatu*
- *Til tail*

Instruments- Gas, Vessels, Cloth, Spoon, Thread.



METHOD

Gandhak Shodhan



Preparation of *Gandhak Druti*



Antimicrobial and Antifungal activity of *Gandhak Druti*

Step 1 GANDHAK SHODHAN

Reference - *Ayurved Prakash*

Material

Raw *gandhak* -100 gm

Godugdha- in required quantity

Goghrut- 100 gm.

Method

first *Godugdha* of normal temperature was taken in a vessel. After that, the vessel was covered with clean cotton cloth and tied at neck firmly. Then required *goghruta* was taken in a steel vessel and heated on slow fire. When *goghruta* completely melted then powdered *gandhak* was added to it. After melting of *gandhak* in *goghruta*, mixture was poured in a vessel having *godugdha* through cotton cloth. The impurities like Stones and other physical structures remained on cloth and *gandhak* get filtered in *godugdha*. During pouring of

gandhak in *godugdha*, continuous stirring was done to avoid blockage of cloth due to the cooling of *gandhak* over it. Then *shudha gandhak* was washed out with hot water till it gets free from *goghruta* and *godugdha*. It is shown in figure no.1.



Figure 1 Gandhak Shodhan

This process was repeated for twice and every time fresh *goghrut* and *godugdha* was taken². *Gandhak* before *shodhan* and after *shodhan* is shown in figure no.2 and figure no.3.



Figure 2 Gandhak Before shodhan



Figure 3 Gandhak After shodhan



The quantity of *gandhak* obtained after *shodhan* is mentioned in table no1.

Table 1 *Shudha gandhak* obtained after dhalan

No. of Dhalan	Quantity of Gandhak Obtained	Quantity of Goghрут Required
1 st Dhalan	90 gm	100 gm
2 nd Dhalan	85 gm	90 gm
3 rd Dhalan	80 gm	85 gm

Step 2 PREPARATION OF GANDHAK DRUTI

Reference –*Rasa Ratna Samuchhaya* 3/27-31

Material

Gandhak – 80 gm

Trikatu – 5 gm

Til tail – In required quantity.

Method

First mixture of *trikatu* (1/16 of *gandhak*) and *gandhak churna* was made in *khalwa yantra*. Then this mixture was sprinkled over cotton cloth, and was rolled gradually from one end to another end till *varti* forms. Then tied this *varti* with the help of thread and then it was immersed in a vessel containing *til tail*⁴, as shown in figure no.4



Figure 4 Preparation of Gandhak Druti Druti

After 3 hours *varti* was removed from tail. Then *varti* was held at one end with forceps and opposite end was ignited by fire. Then the drop of oil dribbling from burning ends was collected in bottle⁴. This is shown in figure no.5, figure no.6 and figure no.7



Figure 5



Figure 6



Figure 7 Gandhak Druti

Physicochemical Analysis of Gandhak Druti

The Physicochemical Analysis of *gandhak Druti* mentioned in table no2



Table 2 Physicochemical Analysis of Gandhak Druti

Test	Result
Appearance	Thick Black Syrupy Liquid
Colour	Black
Odour	Emitting obnoxious Sulphoraceous smell
Taste	Strong bitter
Ph	6.4
Loss on Drying	3.78
Loss on ignition	24.55
Solubility	4.85

Step 3 ANTIMICROBIAL AND ANTIFUNGAL ACTIVITY OF GANDHAK DRUTI

Method

Cup plate method

❖ *Gandhak Druti* was tested against

- 1) *Staphylococcus aureus*,
- 2) *Pseudomonas aeruginosa*
- 3) *Candida albicans*

This method depends on the diffusion of the drug from cavity through solidified agar layer. Such that growth of the added microorganisms is prevented entirely in a circular area or zone around the cavity containing solution of the drug⁵. This is shown in figure no.8, 9 and 10.



Figure 8 *Pseudomonas aeruginosa*

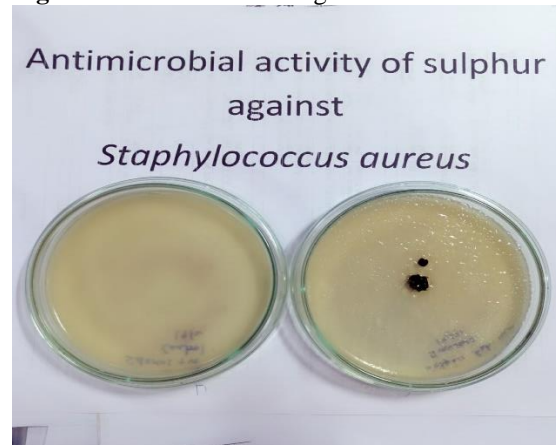


Figure 9 *S.aureus*

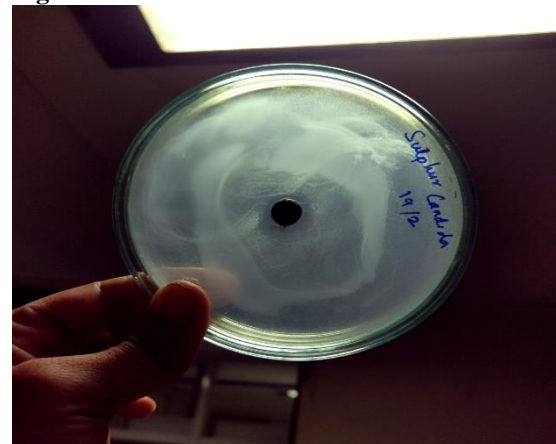


Figure 10 *Candida albicans*

RESULT

The effect of *Gandhak Druti* against Bacteria *Staphylococcus aureus*, *Pseudomonas aeruginosa* and Fungi *Candida albicans* was given in table no.3.

Table 3 Results of Gandhak Druti against *S.aureus*, *P.aeruginosa*, *C.albicans*

Sr.no.	Test organism	Observations	Diameter of zone of inhibition	Remark
1.	<i>S.aureus</i>	No zone of inhibition	None	Resistant
2.	<i>P.aeruginosa</i>	No zone of inhibition	None	Resistant
3.	<i>C.albicans</i>	zone of inhibition observed	18 mm	Susceptible



DISCUSSION

This study was undertaken to check Antibacterial and Antifungal activity of *Gandhak druti*. For this, *druti* was tested against bacteria *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Candida albicans*.

It was found that the *S.aureus* and *P.aeruginosa* depicted resistance towards *Gandhak druti* whereas *C.albicans* depicted susceptibility towards *Gandhak Druti* with a zone of inhibition measuring 18 mm.

So we can say that, *Gandhak Druti* can be used as an ideal medicine in fungal infections like *candida albicans*.

Gandhaka is mentioned as *Krimighna* in ancient *Ayurvedic* texts. *Gandhak Druti* also has wide range of therapeutic action as mentioned in *ayurvedic* text. It is used in diseases like *Kusta*, *kandu* etc. which shows a clear involvement of bacterial and fungal activity. Hence from classical text we can say that *gandhak druti* have antibacterial and antifungal activity⁶.



REFERENCES

1. Rachana C, Difference Between Bacteria and Fungi, August 8, 2018.
2. Sitawar Sainath Bhagwanrao, Antimicrobial studies of Shuddha Gandhak of Ayurved Prakash and Rasayansar method, International Ayurvedic Medical Journal, July 2015, volume 3, Issue 7.
3. Patil Anuradha, A Review on the concept of Druti: A basic principle of Rasashastra, International Ayurvedic Medical Journal, May-June 2014, volume 2; Issue 3
4. Saha Suparna, Panwar Omprakash, Dubey Gajendra, Debbarma Pramod, Kumar Sanjay, Rao K. Shankar, Pharmaceutical study of Gandhak Druti and Gandhak taila by different classical techniques, IJAPC, 2018, vol 9, issue 1.
5. Reshma M. Saokar, R.S. Sarashetti, Veena Kanthi, Madhav Savkar, C.V. Nagthan screening of antibacterial and antifungal activity of gandhak rasayana-an ayurvedic formulation 2015.
6. Dr. Prasanna Kumar, Dr. vijay kumar, Dr. Yumnam Devi, In vitro antifungal activity of gandhak rasayana
7. Rasa ratna samuchhaya, Acharya Siddhinandan Mishra, chaukhamba orientaliya, shlok no-3/29-30, page no-65, 2011.
8. Ayurved Prakash, Shreegulrajsharma Mishra, shlok no-2/21-24 chaukhamba publication.
9. Dasari Srilakshmi, S. Swetha, Prasanna Lakshmi, In Vitro Antimicrobial activity of Tal sindoor 2014.