ISSN 2229-3566
Research Article

IJRAP
www.ijrap.net

ANTI-BACTERIAL ACTIVITY OF RASAMANIKYA

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Received on: 05/08/11 Revised on: 12/09/11 Accepted on: 02/10/11

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ABSTRACT
The Indian classics of Rasashastra have contributed numerous rasayogas for various diseases. Rasamanikya is one of the simple preparations found in various texts. There are different methods of preparations with difference in ingredients are available. For the present study, reference from siddha bheshaja manimala was taken, in which, shodhita haratala is the only ingredient in Rasamanikya. This is said under jwaradhikara, though indicated in certain other diseases. An effort was made to evaluate the antibacterial efficacy of rasamanikya on staphylococcus aureus (gram positive bacteria) and pseudomonas aeruginosa**(** gram negative bacteria**).**
Key words: Rasamanikya, Shodhita haratala, Kirby bauer method, Gradient plate technique.

INTRODUCTION

Rasashastra uses several minerals and metals as the tools for both Rasayana and Therapeutics. Most of these are obviously toxic in nature. However, they are used after subjecting them to proper purifactory procedures which are elaborately dealt in our classical Rasashastra texts.

As a matter of fact, any drug or formulation, even if it is visha – toxic and intense, they can act as very useful medicament, where even a simple drug or formulation can become dangerous if not used properly. These formulations especially bhasmas etc., are having minute dosage and quick acting, as noted in the verse,

Haratala is one of the drugs which is considered as toxic as it is an arsenic compound. However, it's effectively used in the treatment of certain disorders like kushta, shwasa and kshaya.

Rasamanikya is one of the simple formulations having haratala as the main ingredient claimed to be having maximum therapeutic utility.It is called so because of its appearance like manikya with dark red, shinning appearance. There are many references of Rasamanikya. (Table 1).

Classically, there are three methods of preparation of Rasamanikya.

- Using abhraka patra[3]
- Using sharava samputa[4,5,6,]
- Using kupi pakva vidhi[7]

Practically, open sharava and electric bulb are also used to prepare Rasamanikya.

MATERIALS AND METHODS

The materials used are:

- Ashoditha haratala – 30 gms
- Kushmanda swarasa – 100 ml
- Shoditha haratala – 25 gms
- Abhra patras of dimensions 8 cm * 8 cm with thickness of approximately 0.2 cm.
- Heating apparatus.

30 gram of Ashuddha haratala was purified by subjecting it to swedana with 100 ml of kushmanda swarasa for 3 hours.[2] After swedana , 25 grams of haratala was obtained. Rasamanikya was prepared according to the reference of siddhabheshaja manimala.[3]

ApÉëxÉÇmÉÑOûaÉÇ iÉÉsÉÇ ÌMüÎgcÉaÉ…¡ûÉUxÉÉÍkÉiÉqÉ | uÉÉiÉwsÉåwqÉeuÉUå zÉxiÉÇ qÉÉÍhÉYrÉUxÉzÉÎoSiÉqÉç||

Shodhita haratala was evenly spread between abhrakapatras and heated on mild flame till the haratala attains the colour of manikya. The flakes of Rasamanikya which are obtained are pounded into fine powder using khalva yantra.

ANTI-MICROBIAL STUDY

The Anti – bacterial activity of Rasamanikya was evaluated to prove that it can act equivalent to the antibiotics used in modern medicine. The study was done on two bacteriae namely- Staphylococcus aureus (Gram positive) and Pseudomonas aerginosa (gram negative). Effectiveness of antibiotics in the test is based on the size of inhibition. The zone of inhibition also depends on the diffusibility of the antibiotic, the size of the inoculum, type of media and other factor.

The activity was determined by two methods:

1) Kirby bauer method
2) Gradient plate technique

1. Kirby Bauer Method

Principle Antibiotics are antimicrobial agents that inhibit growth of many bacteria and fungi. Diffusions of the antibiotics from the filter paper soaked in antibiotic solution results in a concentration gradient of an antibiotic. Sensitivity is measured as the zone of clearance on the lawn of sensitive bacteria. It inhibits growth of many types of bacteria and fungi[8].

Procedure Mueller-Hinton medium was prepared, sterilized and poured into the sterile petriplates and was allowed to solidify.

- Cultures of Staphylococcus aureus and Pseudomonas aerginosa were uniformly spread on to the plates containing the media using cotton swabs.
- 100 mg of the formulation was dissolved in 1ml methanol and 2ml water.
- Sterile discs of Himedia were soaked in the suspension of medicine for 5 to 10 mins and later it was dried.
- The dried discs were placed on the previously swabbed petriplates.
- Later the plates were incubated at 37^0C for 24 hours.
- After 24 hours of incubation the plates were checked for the formation of inhibition zone.

2. Gradient Plate Technique

- The plate is placed on a pencil or other object to tilt one end up with the arrow, so that it is at a right ***angle*** to the object in the plate.
- A tube of the melted-cooled medium without antibiotic is poured into the plate and allowed to harden. The tilt of the plate should be

such that the liquid doesn't quite reach to the top edge of the angled plate.

- When the agar has hardened (2-5 minutes), the plate is kept flat on the desk and the medium containing the antibiotic is added. It is allowed to harden for 15 to 20 minutes. It can be placed in the refrigerator to speed up hardening.
- Using sterile inoculation loop organisms are streaked in a zigzag manner over the surface of the medium, being careful not to tear the agar.
- Incubated for 72 hours.
- The plate is observed for the pattern of bacterial growth [8].

Results-(PLATE -1)

Method 1

Zones of Inhibition were observed for both Staphylococcus aureus and Pseudomonas aeruginosa at the concentration of 100mg. The diameter was 2.5 cm for S.aureus and 1.6 cm for P.aeruginosa.

Method 2

The organisms used in the study, Staphylococcus aureus and Pseudomonas aeruginosa showed positive result. The organisms did not show growth in the region which contained Rasamanikya.

DISCUSSION

Rasamanikya is a single drug preparation with Shuddha Haratala (considered as Arsenic Tri Sulphide), which is claimed to be least toxic described in Rasashastra texts. It is mainly indicated in disorders like kushta, shwasa, rajayakshma, jwara. In the present study, Rasamanikya was prepared abhraka patras. Though Rasamanikya is indicated various disorders, the study is conducted on the bacteriae causing skin disorders.

The shodhana reduces toxic effects of the haratala comparatively. It alleviates kapha, rakta dosha, indicated in kushta, upadamsha – which are considered as the infectious conditions. Hence, in order to confirm, anti – bacterial activity of Rasamanikya, in which haratala is the only ingredient.

There are numerous bacteriae affecting the skin, causing different infections. Among them, the test is done on, *Staphylococcus aureus* (gram positive) & *Pseudomonas aeruginosa* (gram negative).

Staphylococcus aureus is the most common cause of "Staph Infections". It is frequently part of the skin flora in the nose and on skin. It causes skin infections such as pimples, impetigo, boils, folliculitis, carbuncles, scalded skin syndrome and abscess. Also life-threatening diseases such as pneumonia, meningitis etc.

Pseudomonas aeruginosa is a Gram-negative, aerobic, rod-shaped bacterium with unipolar motility. It causes infections, inflammations, sepsis. Their colonizations occur in critical body organs, such as the lungs, urinary tract and kidneys the results can be fatal. It thrives on most surfaces,bacterium is also found on and in medical equipments including cathetors, causing cross-infections.

Kirby – Bauer method showed activity at 1oo mg dose of the drug, whereas the gradient plate technique method showed the bacteriae are sensitive to the drug.

CONCLUSION

- Haratala is one among the three arsenic compounds with least toxicity described in texts of Rasashastra.
- Various methods of preparation under different adhikaras are traced in the classics of Rasashastra.
- Rasa manikya is the preparation with haratala as main ingredient.
- It is mainly indicated in kushta and pranavaha sroto dushti vikara.
- Anti bacterial activity is found on *S.aurues* (gram positive) and *P.aeurginosa* (gram negative).
- It can be effectively used as an antibiotic in infections caused by these bacteriae.

ACKNOWLEDGEMENT

Dr. Lakshmeesh Upadhya, Principal, JSS Ayurveda medical college, Mysore

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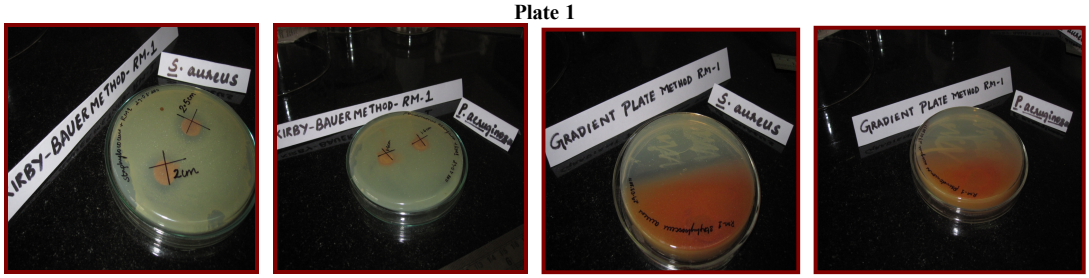
Plate 1



KB method- S.aureus KB - P.aeruginosa GP method -S.aureus GP method -P.aeruginosa

Table 1: References of rasamanikya

Sl .no.	Method of preparation	Reference	Chapter/ adhyaya
1.	Using abhraka patra	Siddhabheshaja manimala	Jwaradhyaya as 'Kumuda Rasa'
2.	Using sharava samputa	• Rasendrasarasangraha • Bhaishajya Ratnavali • Rasendra chintamani	Kushtadhyaya as 'Manikya Rasa'
3.	Using kupi vidhi	• Rasaprakasha sudhakara	Rajayakshma adhyaya as 'Manikya Rasa'/'Tala Manikya'

Source of support: Nil, Conflict of interest: None Declared