

PHYSICO CHEMICAL ANALYSIS OF TALIKA VATI (3rd METHOD) AND EVALUATION OF ITS ANTI-BACTERIAL ACTIVITY W.S.R. TO THROAT INFECTION

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ABSTRACT:

Talika vati (3rd method) is an *Ayurvedic* formulation containing herbo mineral compounds. It is indicated against all types of *Kanth roga* (throat infections). In this study *Talika vati* was prepared in accordance with description of *Rasa yoga sagar*. *Talika vati* was investigated for Physico- chemical analysis with the help of pH, Loss on drying, Ash value, Water soluble as, Acid insoluble ash etc. The findings of results were close to its standard value and have shown the purity of *Talika vati*. Qualitative test was conducted by AAS; findings suggested the presence of organic form of Arsenic (2.49 ppm) & Sulfur test showed Sulfur (1.19 %). *Talika vati* was screened for in vitro - Anti bacterial activity against *Staphylococcus* & *Streptococcus pneumonia* strain using Agar well Diffusion method. *Talika vati* extracts exhibited Anti bacterial property against *Staphylococcus* bacteria in different concentrations (50, 100,150 & 200 microL).

Keywords: *Talika vati*, Physico chemical analysis, *Kanth roga*, Throat infection, Anti bacterial activity, *Staphylococcus*, *Streptococcus pneumonia*.

INTRODUCTION: A number of different Bacteria can infect the human throat. Many Anti Bacterial Drugs are available in medical routine practice, which give established therapeutic benefits. But these Anti Bacterial Drugs may causes side effects. Thus in the present day there is a need to find alternative medicinal formulation against the Bacterial strain related to throat infection. In *Rasashastra* science, many medicines have been mentioned which has better action against the Bacterial infections. Of which *Talika vati* (3rd Method) is one of the considerable herbo-mineral medicine mentioned in *Rasayogasagar* text¹. *Talika vati* is especially claimed for all types of throat infection (*Kanthgat Roga*). The ingredients of *Talika vati* are *Shodhit Harital*, *Shodhit Manasila Daruharidra Yavakshar*, *Saindhav*, *Sudha* & *Madhu*. These contents have anti bacterial property. Therefore an attempt was from the study “Physico chemical analysis of *Talika vati* (3rd method) and Evaluation of

its Anti-Bacterial activity w.s.r. to Throat infection.” and to provide scientific data and efficacy with this project by:

- To analyze the Physico chemical parameters of *Talika vati* (3rd method).
- To evaluate anti bacterial action of *Talika vati* (3rd method) on selected Bacterial strains which causes throat infection. In this matter, two different strains of Bacteria, specifically *Staphylococcus* & *Streptococcus Pneumoniae* strains were selected for the study.

MATERIALS & METHODS:

Source of Data:

- **Source of Drug:** All raw materials were collected from recognized source and authenticated by *Rasashastra* & *Bhaishajya kalpa* dept & *Dravyaguna* department of Shri J.G.C.H.S.Ayurvedic medical College, Ghataprabha, and Karnataka.
- **Pharmaceutical sources:**

Preparation of Talika vati, has been carried out in Teaching Pharmacy of J.G.C.H.S.Ayurvedic medical College, Ghataprabha, Karnataka.

Analytical source:

Physico- chemical analysis were carried out at –

Shikshana prasark mandal's Late Prin. B.V. Bhide foundation & Research in Chemistry, Ayurveda & Allied Sciences

RESULTS:

S.P.College campus, Tilak road, Pune, Maharashtra.

Anti Bacterial Study:

Sources: General throat infection causing Bacterial cultures of Staphylococcus & Streptococcus Pneumoniae were obtained from the Microbiology lab of Jeevan Regional diagnostic Lab, Belgaum Karnataka.

Table no 1: Organoleptic analysis of Talika vati.

Sr No	Organoleptic analysis	Results
1	Color	Dark yellow color
2	Odor	Pungent
3	Taste	Saline & bitter
4	Consistency	Solid rounded tablet
5	Average weight	1.012gm
6	Average Thickness	1.112 cm/ vati

Table no 2: Physico chemical analysis of Talika vati

Sr No	Name of the Test	Results Obtained (%)
1	pH 1%	8.02
2	Loss on drying at 110°C	5.84
3	Ash value	14.09
4	Acid insoluble ash	8.97
5	Water soluble ash	10.23

Table no 3: Quantitative test of Talika vati

Sr No	Name of the Test	Results Obtained (kg/cm ²)
1	Hardness Test	1.0
2	Friability test	1.10
3	Disintegration Time	11 min. 25sec.

Table no 4: Chemical test of Talika vati.

Sr No	Name of the Test	Results Obtained
1	Sulfur content	11.19 (%)
2	Arsenic content	2.49Ppm

Results of in-vitro Anti Bacterial Study of Talika vati.

Results of the inhibition zone value of Talika vati against Staphylococcus is presented in table no 6 & 7 & Figure no 1 & 2.

Table no 5: Standard value of Zone of Inhibition

Sr No	Standard Drug	Zone of Inhibition
1	Amikacin	20mm
2	Ofloxacin	18mm
3	Gentamicin	10mm

Table no 6: Zone of Inhibition of Talika vati extracts against Staphylococcus was analyzed. Results of analysis are mentioned in mm.

Sr No	Talika vati Extract	Zone of Inhibition
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1	50 microL	10 mm
2	100 microL	11 mm
3	150 microL	11 mm
4	200 microL	12 mm

The above table reveals that, *Talika vati* extracts showed Anti bacterial activity against Staphylococcus strain.

Table no 7: Zone of Inhibition of *Talika vati* extracts against Streptococcus Pneumoniae was analyzed. Results of analysis are mentioned in mm.

Sr No	Talika vati Extract	Zone of Inhibition
1	50 microL	10 mm
2	100 microL	12 mm
3	150 microL	14 mm
4	200 microL	16 mm

The above table reveals that, *Talika vati* extracts showed Anti bacterial activity against Streptococcus Pneumoniae strain

DISCUSSION:

Organoleptic characteristics:

The developed formulation was dark yellow colored, pungent odor, has saline & bitter in taste. Average weight of each tablet was 1.012 gm. Average thickness of each tablet was 1.112 cm.

pH of Talika vati: pH value of *Talika vati* was found 8.02 (Table no 2). This has shown alkaline nature of formulation, due to the reason of use of liquid media in *shodhana* process. In addition to that, there is presence of *Sudha churna* (lime stone)² of pH 11.6 and *Yavakshara*³ of pH 10.5, *Yavakshar* which were already in alkaline pH range.

Loss on drying: Low moisture content is desirable for higher stability of the formulation. Moisture content of *Talika vati* was found 5.84% (Table no 2).

Ash value: It is criteria for indentifying the purity of the drugs. Total ash is inclusive of extraneous matter such as sand, soil etc adhering to the herbal drug. Ash value of *Talika vati* was found 14.09 % (Table no 22).

Water soluble Ash: Water soluble Ash was found 10.23 % (Table no 2). This shows normal quality of the drugs of the formulation (*Talika vati*) and presence of more active principle in the sample.

Acid insoluble ash: Acid insoluble ash was found 8.97 % (Table no 2). This shows less adherent dirt and sand particles.

Hardness test: The average hardness of *Talika vati* samples were determined by monganto tablet hardness tester. The hardness of *Talika vati* was 1.0 kg/cm² (Table no 3). This indicates *Talika vati* was not brittle in nature.

Friability test: It is a measure of Tablet strength. It was measured by Roche Friabilator. Friability of *Talika vati* was found 1.10 kg/cm² (Table no 3). This is indicated acceptable form of *Talika vati*.

Tablet Disintegration Tester:

In this Test, at the end, all the tablets of *Talika vati* disintegrated completely in 11 min. 25sec. (Table no 3) without leaving any residue in the basket.

AAS is a standard tool to get the purity of arsenic and other metals.

Arsenic content: Arsenic content of *Talika vati* was found 2.49 ppm (Table no 4) by AAS method. In this position, Arsenic content was in organic form.

Sulfur content: Sulfur content of *Talika vati* was found 1.19 % (Table no 4). After carrying out the *shodhana* process on *Harital* & *manasila*, there was embodiment of Sulfur (*Gandhak*) from inorganic state to organic matter.

Herbal media was used in *shodhana* process on *Harital* & *Manasila*. For this reason, Arsenic compound was bounded to other organic functional groups. Therefore organo-arsenic compounds are far from

toxic effects⁴. Arsenic metal and these are relatively safe in treatment if administered in appropriate dose.

In-Vitro Anti bacterial study: For this purpose, different concentrations of water extracts of *Talika vati* (50microL, 100 microL, 150 microL, 200 microL,) was used & evaluated using Agar well Diffusion method on Muller Hinton Agar. *Talika vati* extracts was determined against Staphylococcus (Gram +ve organism) & Streptococcus Pneumoniae strain (Gram -ve organism) which is associated with throat infection. Inhibition Zone of *Talika vati* extracts have shown Anti bacterial activity against Staphylococcus. (Table no 6 & 7) (Figure 1 & 2). The Amikacin, Ofloxacin, Gentamicin have highest anti bacterial activity against Staphylococcus & Streptococcus Pneumoniae strain value of Inhibition Zone was shown in Table no 5. This indicates Antibiotics are more powerful drugs that fight Bacterial infection. Although their continuous use produces adverse side effects & causes antibiotic resistance in the Bacteria⁵. In this regard, *Talika vati* can be used as a substitute for modern antibiotics. As *Talika vati* formulation may be ascribed the presence of krimighna property. Thus it can be considered that *Talika vati* is effective medicine to prevent, recurrence and alternative medicine against the Bacterial infections in throat.

Probable mode of action of Talika vati (3rd Method): All the drugs used in *Talika vati* are having strong Anti bacterial activities thus helps in elimination of Infection from throat. *Harital*, *Manasila* & *Daruharidra* are having *Katu* & *Tikta rasa*, thus it possesses *Krimighna* (Anti Bacterial) property^{6,7,8}. *Yavakshar* is indicated in *Kantha roga* (*Kanth shundi*, *Galagranthi shoth*)⁹. *Sudha churna* is having *Krimighna* property. By this virtue,

Bacterial infection of throat will be prevented.

On analytical study, this formulation was found pH in alkaline media, for this reason, these drugs are more active in alkaline media. With intention of this, *Yavakshar* (pH 10.5) & *Sudha churna* (pH 11.6) are added to the *Talika vati* as ingredients. The same principle is applied in Allopathic medicine such as incase of Amino glycoside antibiotics are more active at alkaline pH¹⁰. *Saindhava lavana* stimulates the digestive power¹¹ & maintains the pH balance in the body¹². In this regard, the mechanism of Anti bacterial activity might be the characteristic feature of synergistic activity between ingredients of *Talika vati* (3rd method). In this way, *Talika vati* (3rd method) ultimately relieves the root cause of throat infection.

CONCLUSION:

- *Bhavana dravya* plays vital role in potentiating the medicinal properties which increases the efficacy of *Talika vati* (3rd method).
- The data obtained from Physico chemical analysis of *Talika vati* (3rd method) can be considered as reference for its standardization.
- Inhibition Zone of *Talika vati* extracts effectively showed Anti bacterial activity against Staphylococcus & Streptococcus pneumoniae strain.
- Therefore *Talika vati* (3rd method) may be considered as good as Anti bacterial drug in the management of Bacterial infection in the throat.
- Clinical study of *Talika vati* (3rd method) can be carried out for its Anti bacterial activity on throat infection which is caused by Staphylococcus & Streptococcus Bacteria

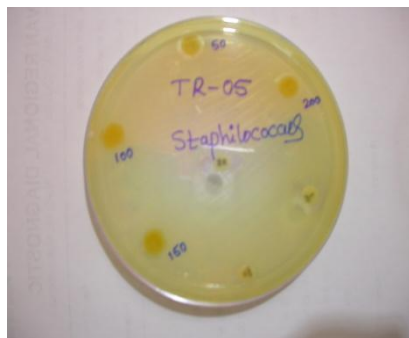


Figure 1: Talika vati showed Anti Bacterial activity against Staphylococcus at 50 microL, 100 microL, 150 microL & 200 microL.



Figure 2: Talika vati showed Anti Bacterial activity against Streptococcus Pneumonia strain at 50 microL, 100 microL, 150 microL & 200 microL.

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Declared

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