

Pharmacognostical and Physico-chemical Evaluation of *Nagaradi Kashaya*

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Abstract

Lifestyle disorders are one of the biggest health issues towards the world. Faulty dietary habit is the cause of many digestion related diseases like Constipation, Irritable Bowel Syndrome, Gastroesophageal Reflux Disease, Peptic ulcers etc. The ingredients of *Nagaradi Kashaya*, *Nagara* (Rhizome of *Zingiber officinale*), *Musta* (Rhizome of *Cyperus Rotundus*) and *Ativisha* (Root of *Aconitum heterophyllum*) are very good appetizer and have stomachic, laxative, digestive, carminative, stimulant, expectorant, thermogenic and antihelmintic properties which helps to digest food properly and maintain the digestive capacity. The drug is going to be used in the form of coarse powder and will be subjected to pharmacognostical and physicochemical evaluation. The pharmacognostical results show simple starch grains of *Shunthi*, fibres of *Ativisha*, annular vessels of *Musta* etc. The physicochemical results show pH value of 6.5, loss on drying 4.56% w/w and ash value of 7.2% w/w.

Keywords

Pharmacognosy, Pharmaceuticals, Nagaradi Kashaya



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INTRODUCTION

The quality of life and quality of diet have changed in present era. Due to today's chaotic and busy lifestyle people cannot follow rules of consuming food i.e., *Aharavidhivisheshayatana*². All these factors cause harmful effect on digestive system of human beings and promote Irritable Bowel Syndrome, Gastro Esophageal Reflux Disease etc diseases. In this study *Nagaradi Kashaya* is used in

Table 1 Ayurvedic properties of *Nagaradi Kashaya*³⁴⁵:

<i>Dravya</i>	<i>Rasa</i>	<i>Guna</i>	<i>Virya</i>	<i>Vipaka</i>	<i>Doshagnata</i>
<i>Nagara</i>	<i>Katu</i>	<i>Laghu, Snigdha</i>	<i>Ushna</i>	<i>Madhura</i>	<i>Vata-Kapha shamaka</i>
<i>Musta</i>	<i>Katu</i>	<i>Laghu, Ruksha, Tikshna</i>	<i>Ushna</i>	<i>Katu</i>	<i>Vata-Kapha shamaka</i>
<i>Ativisha</i>	<i>Tikta, Katu</i>	<i>Laghu, Ruksha</i>	<i>Ushna</i>	<i>Katu</i>	<i>Vata-Pitta shamaka</i>

Contents of *Nagaradi Kashaya* are having *Katu Rasa*, *Ushna Virya* and *Katu Vipaka* hence it works as *Agni Deepaka* and *Pachaka Dravya*. So it is useful in conditions such as *Grahanidosha* by improving *Jatharagni*.

MATERIALS AND METHODS

Collection of Raw Drugs:

All the raw drugs of *Nagaradi Kashaya* were collected from Pharmacy of Gujarat Ayurved University, Jamnagar.

Selection of drug:

Grahanidosha i.e., all kind of disturbance in *Jatharagni* (digestive capacity). *Nagara*, *Musta* and *Ativisha* are having *Dipana*, *Pachana*, *Vatanulomana*, *Grahi* etc properties which are useful to improve digestive power and to correct *Grahanidosha*. Till date no reference has been found on *Nagaradi Kashaya*. In the present study it is subjected for the pharmacognostical and phytochemical aspects to evaluate the drug.

Trial drug *Nagaradi Kashaya* is a poly herbal formulation available in the form of *Yavakuta*. Three drugs of *Nagaradi Kashaya* described in *Charaka Samhita*, *Grahanidosha Chikitsa Adhyaya* were combined in equal quantity and the patients were advised to make decoction with proper method.

Method of preparation of *Nagaradi Kashaya*:

Nagaradi Kashaya was prepared in Pharmacy of Gujarat Ayurved University, Jamnagar. Ingredients, part used and ratio of the drugs is given in Table-1. All three ingredients taken in equal quantity in the



form of *Yavakuta* (coarse powder) and

mixed thoroughly.

Table 2 Contents of *Nagaradi Kashaya*⁷

Sr. No.	Content	Latin name	Part used	Proportion
1	<i>Nagara</i>	<i>Zingiber officinale</i> Roxb.	Rhizome	1 part
2	<i>Musta</i>	<i>Cyperus rotundus</i> Linn.	Rhizome	1 part
3	<i>Ativisha</i>	<i>Aconitum heterophyllum</i> Wall.	Root	1 part

Pharmacognostical Evaluation:

Raw drugs taken for *Nagaradi Kashaya* were identified and authenticated by the Pharmacognosy department. The identification was carried out based on the morphological, organoleptic features and microscopy of the raw drugs and *Nagaradi Kashaya*. Microphotographs were taken by using Carl-Zeiss Trinocular microscope⁸.

Pharmaceutical Evaluation:

Following parameters were analyzed for different physico-chemical parameters by today's routine methods at the pharmaceutical chemistry lab, IPGT& RA, Jamnagar.

Physico-chemical Parameters:

Testing of following physico-chemical parameters was carried out as per standard method.

- Loss on Drying at 110° C
- Total Ash value
- Water Soluble Extract
- Methanol Soluble Extract
- pH of 5% v/w aqueous solution of the drug

OBSERVATION AND RESULTS

Organoleptic findings:

Organoleptic findings of *Nagaradi Kashaya* are given in Table -2.

Table 3 Organoleptic Examination

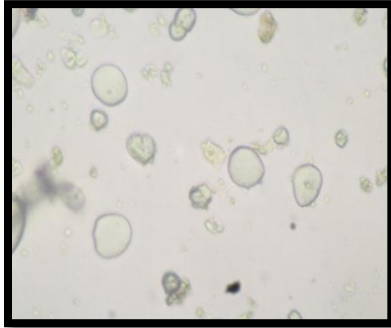
Properties	<i>Nagaradi Kashaya</i>
Colour	Muddy brown
Odour	Slightly aromatic
Texture	Coarse powder
Taste	Tikta(Bitter), Katu(pungent)
Touch	Coarse

Pharmacognostical study⁹:

The initial purpose of the study was to confirm the authenticity of the raw drugs used in the preparation of *Nagaradi Kashaya*. This was achieved by carrying out microscopy of the raw drug i.e.; simple starch grains of *Sunthi*, simple starch grains of *Musta* along with hilum, compound starch grains of *Ativisha*, cork in surface view of *Shunthi*, cork with brown content of *Ativisha*, prismatic crystal of *Ativisha*, fibers of *Ativisha*, fibres of *Shunthi*, annular vessels of *Musta*, stone cells of *Ativisha*, parenchyma cells of *Musta*, scalariform vessels of *Shunthi*, silica deposition of

Musta, olioresin content of *Shunthi*, pitted vessels of *Ativisha* etc.

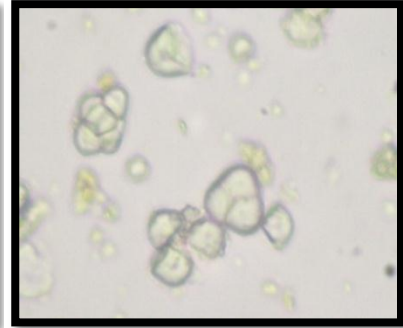
Plate 1: Microphotographs of *Nagaradi Kashaya*:



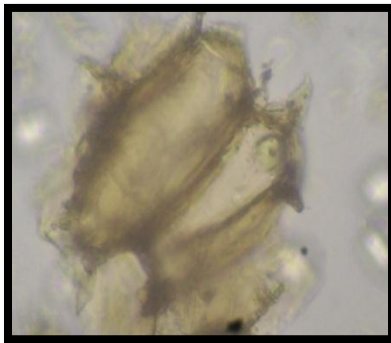
1. Starch grains of *Shunti*



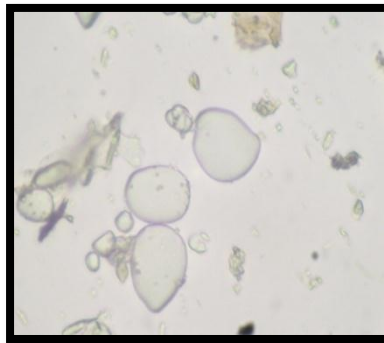
2. Starch grains of *Musta*



3. Simple and compound starch grains of *Ativisha*



4. Parenchyma cells of *Ativisha*



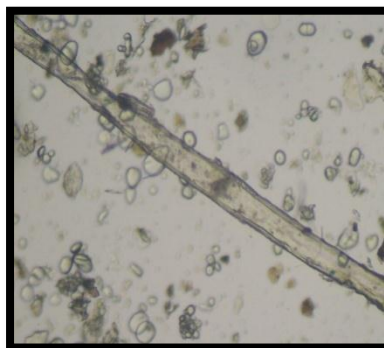
5. Oil globules of *Musta*



6. Stone cells and scleroids of *Ativisha*



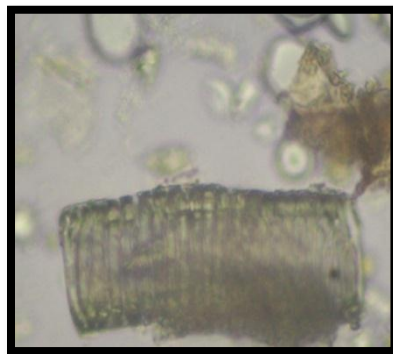
7. Prismatic crystals of *Ativisha*



8. Fibres of *Shunti*



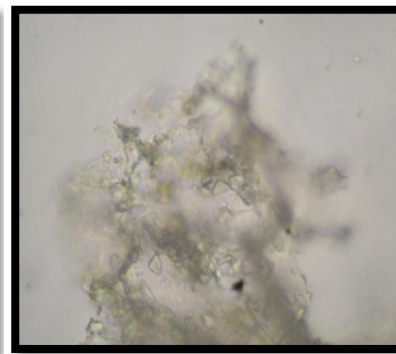
9. Fibres of *Musta*



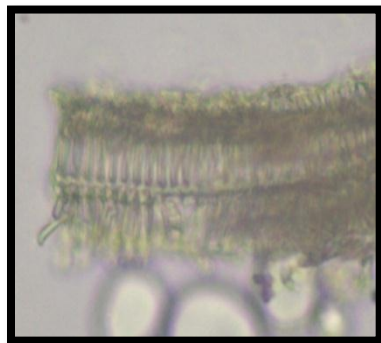
10. Annular vessels of *Shunti*



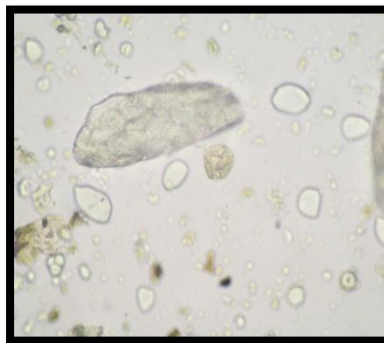
11. Stone cells of *Ativisha*



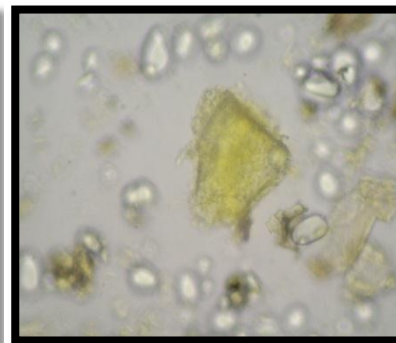
12. Parenchyma cells of *Musta*



13. annular vessels of *Musta*



14. Silica deposition of *Musta*



15. Yellowish content of *Ativisha*

Pharmaceutical Evaluation

Physico-Chemical parameters of *Nagaradi Kashaya* like Total ash value, Water soluble extract, Methanol soluble extract, pH 5% v/w aqua solution, Loss on drying all were found to be within the normal range. Details are given in Table-3. HPTLC was carried out after organizing appropriate solvent system in which maximum 13 spots were distinguished at 254 nm and 11 spots at 366 nm. Results are depicted in the Table No.4.

Table 4 Results of the Drug Analysis on Physico-chemical Parameters

Sr no.	Parameters	Results
1	Loss on Drying at 110 °C	4.65% w/w
2	Total Ash value	7.2% w/w
3	Water Soluble Extract	9.5% w/w
4	Methanol Soluble Extract	4.4% w/w
5	pH 5% v/w aqua solution	6.5



HPTLC of *Nagaradi Kashaya* was done in appropriate solvent system in which 13 spots were found at 254 nm and 11 spots at 366

nm. Table 5 shows No. Of spots and their Rf value observed under UV radiation.

Table 5 Results of HPTLC of *Nagaradi Kashaya*

Track	Solvent system	Observation under UV radiation			
		254 nm		366 nm	
		No.of spots	Rf value	No.of spots	Rf value
<i>Nagaradi Kashaya</i>	Toluene (7ml) : Ethyl acetate (2ml): Acetic acid (1ml)	13	0.03, 0.13, 0.33, 0.40, 0.44, 0.47, 0.54, 0.61, 0.65, 0.72, 0.79, 0.84, 0.95	11	0.03, 0.14, 0.28, 0.33, 0.40, 0.44, 0.56, 0.61, 0.72, 0.86, 0.94

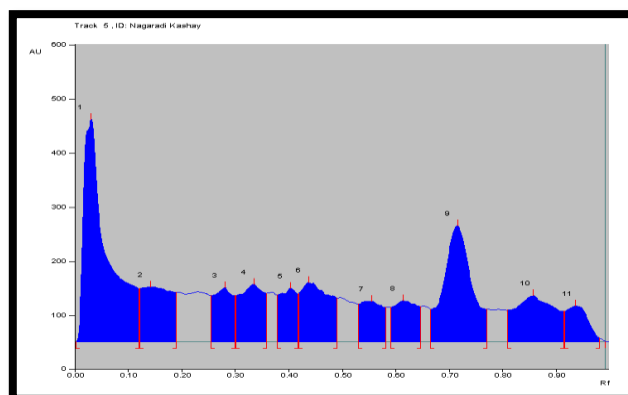
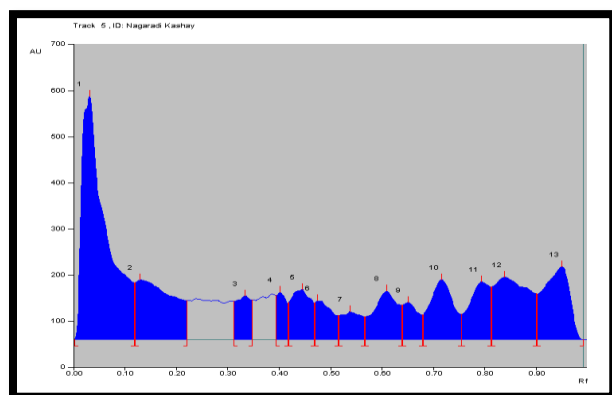
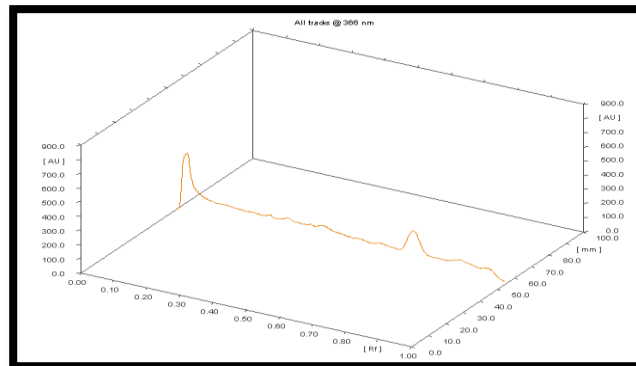
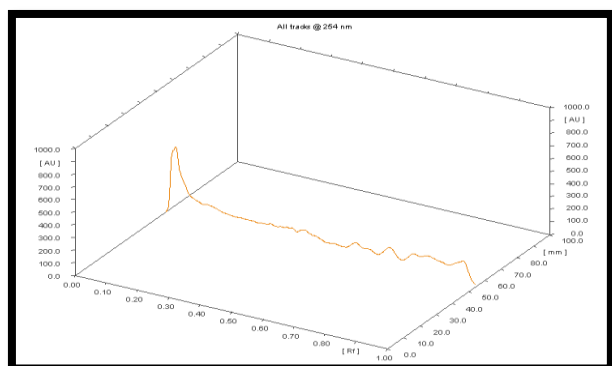
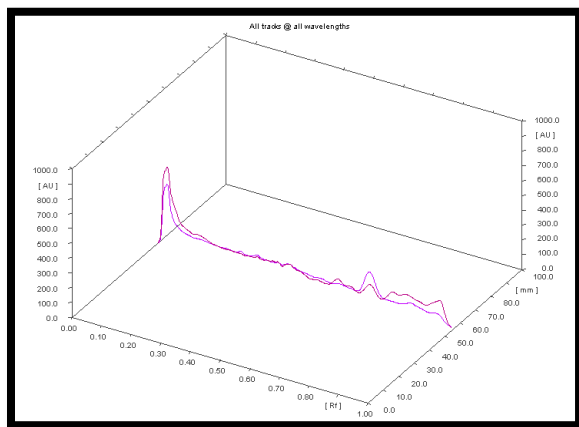


Plate-4HPTLC of *Nagaradi Kashaya* at 254 and 366nm



HPTLC 3-D graph of *Nagaradi Kashaya* at 254 and 366nm



HPTLC comparative 3-D graph of *Nagaradi Kashaya* at 254 and 366nm



Fig. 1: Chromatographic separation in day light



Fig. 2 Chromatographic separation separation at 254 nm



Fig. 3 Chromatographic at 366nm

Below figure shows Chromatographic separation of *Nagaradi Kashaya* in appropriate solvent system at day light, Chromatographic separation at 254 nm and chromatographic separation at 366 nm.

DISCUSSION

The ingredients of *Nagaradi Kashaya* are *Tikta* (bitter), *Katu rasa* predominant *Ushna Veerya*, *Katu vipaka*, *Laghu* and *Ruksha* in nature with obvious alleviating action on all *Dosha*. It also has *Dipana*, *Pachana* and *Grahi* properties which can be used to correct *Grahanidosha* and improve digestion power i.e. *Agni*. In the present study a pharmaceutical preparation of *Nagaradi Kashaya* was carried out. Pharmaceutical properties have to be studied for authenticity of drug; hence the formulation was

subjected to minimum Pharmacognostical and Pharmaceutical analysis. Pharmacognostical evaluation of raw drugs used in *Nagaradi Kashaya* showed the specific characteristic features found in microscopy confirm the authenticity of the drugs.

CONCLUSION

Nagaradi Kashaya formulation was subjected to Pharmacognostical and Pharmaceutical analysis. Pharmacognostical findings confirmed the ingredients of

Nagaradi Kashaya. Physico-chemical and HPTLC studies confirmed that ingredients of drug formulation meet the minimum quality standards at primary level. Generated results are specific and may consider for the further research works.

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