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Research Article

STANDARDIZATION OF *TALISADI CHOORNA* AND GUTI CONTAINING SYNTHETIC *VANSHLOCHAN*

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ABSTRACT

Talisadi choorna and *Guti* is routinely used in the treatment of *Shwas*. *Vanshlochan* is an important ingredient of *Talisadi Choorna* and *Guti*. But *Vanshlochan* has become extinct due to problems in procurement and availability. It is formed only after twelve years of flowering period in hollow internodes of Bamboo. Hence its synthetic substitute is routinely used in Ayurvedic practice and pharmacy. This substitution of natural by synthetic *Vanshlochan*, whether results in any change in therapeutic activity is not yet known. In Ayurvedic texts preparation of *Guti* from *choorna* makes it *Laghu* and easy to digest is mentioned In the present study analysis of synthetic *Vanshlochan* was done. X-ray diffraction of synthetic *Vanshlochan* emitted a blurred peak at 20 degree. This suggests that the sample was amorphous. Surface electron microscopy images were obtained at 10um with resolution of 1000 and 2500. Elemental analysis was done with the help of spot tests, which showed presence of Sodium, phosphorus, potassium. Iron was detected quantitatively with the help of photo-electric calorimeter. Energy dispersive analysis was done in order to confirm the presence of elements detected in chemical analysis. Along with sodium, potassium and phosphorus, other elements like aluminium, silica, calcium, iron, oxygen were detected. In thermogravimetric analysis weight loss of synthetic *Vanshlochan* was gradual from 37 degree to 610 degree. At 610 degree the weight loss was maximum. From 610 degree to 700 degree, weight of the sample remained constant. This established the thermal stability of the sample at 610 degree. *Talisadi choorna* was manufactured according to API standards. Values obtained from the quality control tests performed on *Choorna* were within standard limits. Process of rolling *Guti* leads to size and weight variation. Hence tablets of the mixture were prepared. For preparation of tablet, mixture was transformed into granules. Magnesium stearate was added to the granules as a lubricant to avoid friction during tableting. As magnesium stearate is an excipient it does not affect therapeutic action of *Guti*. Values obtained from quality control tests performed on tablets were within standard limits.

KEYWORDS: *Talisadi Choorna, Talisadi* Guti, Synthetic *Vanshalochan, Tabasheer, Rajyakshma.*

INTRODUCTION

In Ayurveda there are 41 herbal and 82 compound formulations mentioned for treatment of *Shwaas vyadhi.* These formulations are used from thousands of years, which have properties of reducing the etiology of the disease as well as modulate immunity of human body. *Talisadi choorna* is one of the herbal formulations mentioned in Ayurved repertory for the treatment of *Rajyakshma vyadhi*.[1] Ingredients of *Talisadi choorna* are *Ushna, Teekshna*, *Laghu gunatmak* and have *Shwaashar* properties.[2] It is also, a routinely used and widely available formulation. Preparation of *Guti* instead of *Choorna* increases shelf life of formulation, makes it *Laghu* and easy to consume, is mentioned in the texts.[3] But commercially *Guti* is not available on wide scale. *Vanshlochan*, which is one of the vital ingredients of *Talisadi choorna*, has properties to cure asthma, cough and rhinitis.[4] *Vanshlochan* is formed in the internodes of *Bambusa* arundinaceae, a species of bamboo. Now days, due to difficulties in procurement, *Vanshlochan* has become rare and is on the verge of extinction. Hence in Ayurved pharmacies and practice, a synthetic analogue of *Vanshlochan* is used.[5] This substitution of natural by synthetic *Vanshlochan*, whether results in any change in therapeutic activity is not yet known. There is large amount of data available of work done on single ingredients of *Talisadi choorna*, but on the formulation-*Talisadi choorna* only a single study of analysis has been done.[6] Thus it was worth to work on this formulation to generate data of synthetic *Vanshalochan* and standardize *Talisadi Choorna* and *Guti*.

AIM

To standardize *Talisadi Choorna* and *Guti* containing Synthetic *Vanshlochan*

OBJECTIVES

- Authentication of all herbs used in *Talisadi choorna* and *Guti*.
- Collection of Synthetic *Vanshlochan* from standard market source and its analysis.
- Standardization of *Talisadi Choorna* and *Guti*.

Materials

A: Raw drugs

Talis Patra, Marich, Shunthi, Pippali, Synthetic Vanshlochan, Sharkara, Ela, Twak

B. Instruments used for preparation of *Choorna* and *Guti*

Grinder, Sieve no. 36 and 80, Utensils, Burner, Tableting machine

C. Instruments used for analysis

I R Moisture balance, Digital balance, Hot water bath, Crucibles, Muffle furnace, Test tubes, Ph strips, Soxhelet apparatus, Clevenger, Heating mantle, Dessicator, Spot test plate, Dhona single pan balance, Calorimeter, Beaker, Ashless filter paper, Oven, X-ray diffractometer, Sputter coater, Scanning electron microscope, Energy dispersive x-ray analyser.

D. Chemicals used for analysis

Potassium ferrocyanide solution, Ammonium chloride solution, Ammonium Thiocynate, Quinalizarin reagent, Sodium hydroxide, Hydrochloric acid.

Methodology

1.Raw drugs procurement

Raw drugs needed for the preparation of *Talisadi choorna* and *Guti* were collected from Pune city vendors. In all five samples were collected from five different vendors.

2. Raw drug selection

Best drug was selected from the procured samples with the help of consensus method. Experts belonging to Dravyaguna Dept. of Bharati Vidyapeeth college of Ayurved, Tilak Ayurved college, Hadapsar college, as well as peers from the field of Ayurved Practice, selected best drug among the samples. Samples which gained maximum acceptance were selected.

3. Raw drug Authentication

All herbal drugs were authenticated at B.V.C.O.A Dept of R.S.B.K.V Analytical lab. Herbal raw drugs were authenticated as per the guidelines in Ayurvedic pharmacopoeia of India.

Parameters for authentication: [7]

The parameters used for the authentication of herbal raw drugs are as follows.

1. Foreign matter
2. Macroscopic examination
3. Microscopic examination
4. Loss on drying
5. Total ash content
6. Acid insoluble ash
7. Alcohol soluble extractive
8. Water soluble extractive

4. Analysis of Synthetic *Vanshlochan* [8,9]

Synthetic *Vanshlochan* was analyzed with the help of X-ray diffraction, Surface electron microscopy, Energy dispersive analysis, at Physics Department of Pune University. Thermogravimetric analysis and physico-Chemical analysis was done at B.V. Bhide foundation, pune.

5. Manufacturing of *Talisadi Choorna* [10]

Talisadi Choorna was manufactured in departmental pharmacy of Bharati Vidyapeeth Deemed University College of Ayurved, according to API standards and according to reference from Bhaishajya Ratnavali.

Steps involved in manufacturing of *Talisadi choorna*

Size reduction

All herbal drugs, *Sharkara* and synthetic *Vanshlochan* were ground to fine particles using heavy duty mixer grinder.

Particle size uniformity

Fine particles of drugs were passed through sieve size no. 120 to obtain similar size of particles of all drugs.

Preparation of homogenous mixture

Fine particles of all drugs were mixed well according to proportion mentioned in the textual reference with the help of mixer. Thus, *Talisadi choorna* was prepared.

6. Standardization of *Talisadi Choorna* [11]

Standardization of *Guti* was done by conducting tests such as Loss on drying, Ash Value, Acid insoluble ash, Water soluble extractive, Alcohol soluble extractive, pH.

7. Manufacturing of *Talisadi Guti* [10]

Talisadi guti granules were prepared according to reference from Bhaishajya Ratnavali in departmental pharmacy of Bharati vidyapeeth deemed university college of Ayurved and tablets were prepared at Bharati Vidyapeeth deemed university's Poona college of pharmacy.

Steps involved in manufacturing of *Talisadi Guti*

Size reduction

All herbal drugs except *Sharkara*, synthetic *Vanshlochan*, were ground to fine particles using heavy duty mixer grinder.

Particle size uniformity

Fine particles of drugs were passed through sieve size no. 120 to obtain similar size of particles of all drugs.

Preparation of homogenous mixture

Fine particles of all drugs, except *Sharkara*, were mixed well according to proportion mentioned in the textual reference with the help of mixer.

Preparation of Sugar syrup

Distilled water was added to 32 parts *Sharkara*, subjected to heat and syrup was prepared.

Preparation of granules

Choornas of remaining ingredients were mixed with the syrup. This mixture was stirred well, till granules were formed. Granules were passed through sieve no. 36.

Formation of Compressed Tablets

Granules were mixed well with magnesium stearate. The mixture was then subjected to single punch tableting machine. Thus, tablets were obtained.

8.Standardization of *Talisadi Guti* [12]

Standardization of *Guti* was done by conducting tests such as Moisture content, Hardness, Friability, Disintegration, Weight variation, pH

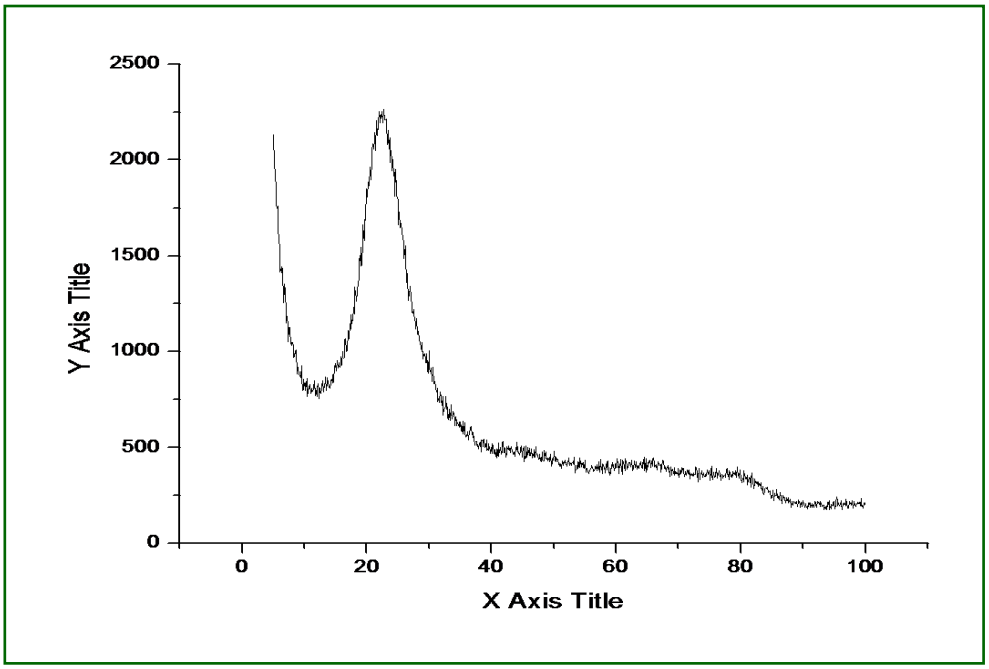
Results

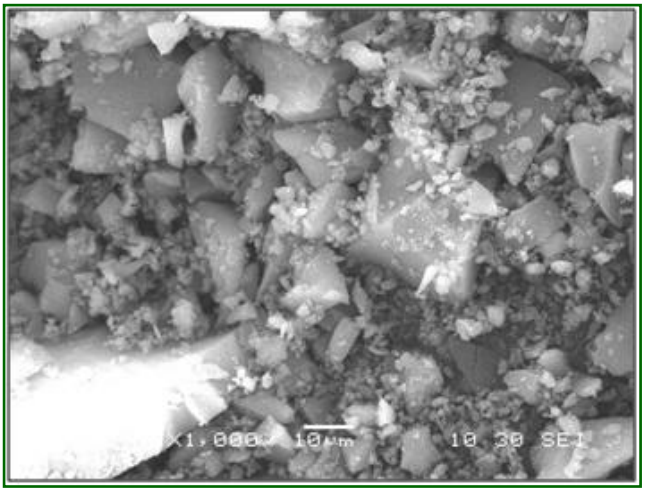
Table 1: Analytical values of raw drugs

Name of the Drug	Foreign matter		Ash value		Acid insoluble ash	
	Standard Values (API)	Obtained Values	Standard Values (API	Obtained Values	Standard Values (API	Obtained Values
Talish	NMT 2%	0.2%	NMT 6%	6%	NMT1.5%	0.62%
Marich	NMT0.5%	0.3%	NMT 5%	5%	NMT 1%	0.72%
Sunthi	NMT 1%	NILL	NMT 6%	5%	NMT1.5%	0.76%
Pippali	NMT 2%	0.3%	NMT5.5%	4%	NMT 1%	0.9%
Twak	NMT 2%	0.6%	NMT 3%	2%	NMT 4%	2.58%
Ela	NILL	0.8%	NMT 6%	5%	NMT 2%	0.88%

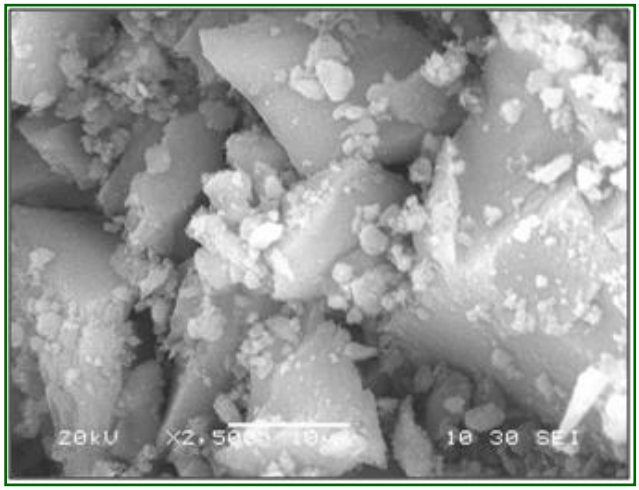
Name of the Drug	Moisture Content		Water Soluble Extractive		Alcohol Soluble Extractive	
	Standard Values (API)	Obtained Values	Standard Values (API	Obtained Values	Standard Values (API	Obtained Values
Talish	5-10%	6.4%	NLT 16%	27.2%	NLT 10%	28.8%
Marich	5-10%	10%	NLT 6%	12.8%	NLT 6%	14.4%
Sunthi	5-10%	9.2%	NLT 10%	12.8%	NLT 3%	16%
Pippali	5-10%	8%	NLT 12%	13.5%	NLT 9%	24.9%
Twak	5-10%	8.2%	NLT 3%	36.8%	NLT 2%	36.8%
Ela	5-10%	9.6%	NLT 10 %	16.7%	NLT 2%	15%

Graph obtained by XRD





Images of Synthetic *Vanshlochan* obtained by SEM at 10 um Resolution 1000



Images of Synthetic *Vanshlochan* obtained by SEM at 10 um Resolution 2500

Table 2: Elements detected by EDAX

Element	Na	Al	Si	P	K	Ca	Fe	O
Atomic%	0.17	0.02	33.97	0.0225	0.025	0.027	0.03	65.46

Graph obtained by TGA

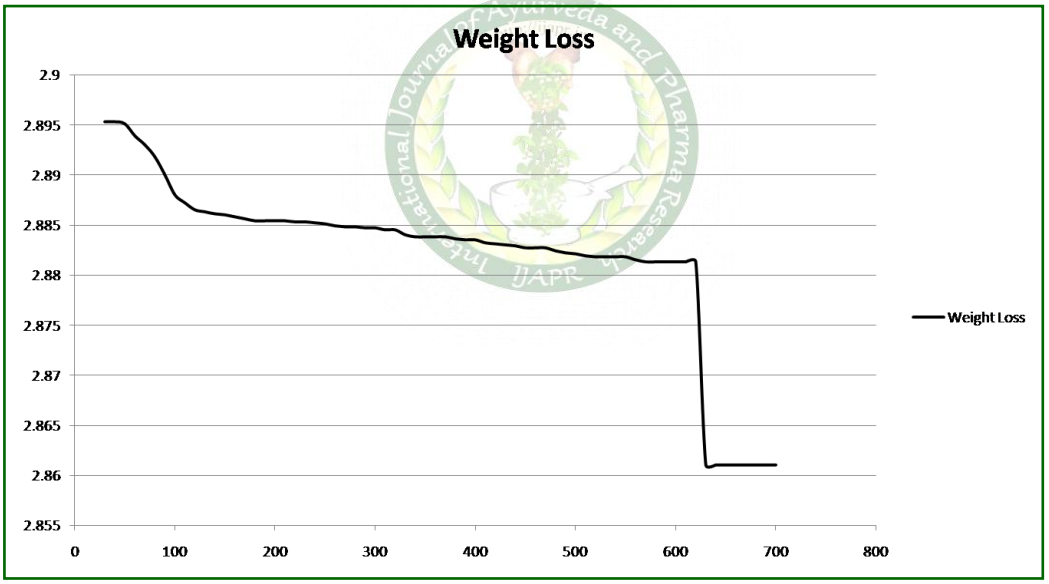


Table 3: Values of Physico-chemical analysis

S.No.	**Name of Test**	**Results**
1	Loss on drying @ 110^0 C	12.29
2	Acid insoluble matter (silica %)	80.92
3	Loss on ignition @ 600^0 C	17.87
4	Ash content	82.13
5	Iron (Quantitatively)	0.020%
6	Sodium (Qualitatively)	Present
7	Potassium(Qualitatively)	Present
8	Phosphorus (Qualitatively)	Present
9	Calcium(Qualitatively)	Absent
10	Magnesium (Qualitatively)	Absent

Table 4: For Standardization of *Talisadi Choorna* following tests were performed

S.No	Parameter	Obtained value percentage w/w
1	Loss on Drying	2.11
2	Ash Value	11.46
3	Acid insoluble Ash	10.78
4	Water soluble extractive	63.82
5	Alcohol soluble extractive	3.72
6	pH	7

Table 5: For Standardization of *Talisadi Guti* following tests were performed

S.No.	Test	Standard value	Obtained value
1	Moisture	NMT9%	5%
2	Hardness	≥ 4kgsqcm	5
3	Friability	≤ 1.6%	0.25%
4	Disintegration	≤ 15min	9min
5	Weight variation	≤ 7.5%	5%
6	pH	----	6

DISCUSSION

Selection of raw materials

In the present study consensus method was applied for the selection of raw materials. This method helps to choose the best raw material among the available market samples.

Authentication of raw drugs

Raw drugs were authenticated with the help of API standards and subjected to following tests- moisture content, total ash content, pH, alcohol soluble extractive, water soluble extractive, acid insoluble ash. The results were within standard limits.

Analysis of synthetic *Vanshlochan*

Analysis of synthetic *Vanshlochan* was done as no data was available.

X-ray diffraction: Sample of synthetic *Vanshlochan* emitted a blurred peak at 20 degree. This suggests that the sample was amorphous, crystalline sample emits sharp peak when subjected to x-ray diffraction. Due to amorphous nature of synthetic *Vanshlochan* it might be easily assimilable in the body.

Surface electron microscopy: As no data was available regarding morphological characteristics of synthetic *Vanshlochan*, it was subjected to surface electron microscopy. Images were obtained at 10um with resolution of 1000 and 2500. These images can work as standard to compare, if further research is carried out by any researcher.

Physico-Chemical analysis: loss on drying, acid insoluble matter, loss on ignition, ash content, were the tests performed on synthetic *Vanshlochan*. Elemental analysis was done with the help of spot tests, which showed presence of Sodium, phosphorus, potassium. Iron was detected quantitatively with the help of photo-electric calorimeter.

Energy dispersive analysis: This test was done in order to confirm the presence of elements detected in chemical analysis. Along with sodium, potassium and phosphorus, other elements like aluminium, silica, calcium, iron, oxygen were detected.

Thermogravimetric analysis: Weight loss of synthetic *Vanshlochan* was gradual from 37 degree to 610 degree. At 610 degree the weight loss was maximum. From 610 degree to 700 degree, weight of the sample remained constant. This established the thermal stability of the sample at 610 degree.

Manufacturing and Standardization of *Talisadi choorna* and *Talisadi Guti*

Talisadi choorna was manufactured according to API standards. All the ingredients were added according to the proportion mentioned in the text. Synthetic *Vanshlochan* was added, which mixed well with all other ingredients. Values obtained from the quality control tests performed on *Choorna* were within standard limits.

For manufacturing of *Guti* modification in the method was done. In routine practice all the ingredients of *Guti*, except *Sharkara* are ground to fine particles then a homogenous mixture of *Choorna* is prepared, which is added to sugar syrup. This mixture of *Choorna* and syrup is subjected to heat on a low flame. When this mixture turns into semisolid form it is manually rolled into pills. This process of rolling pills leads to size and weight variation. To overcome this obstacle, tablets of the mixture were prepared. For preparation of tablet, mixture was transformed into granules. Magnesium stearate was added to the granules as a lubricant to avoid friction during tableting. As magnesium stearate is an excipient it does not affect therapeutic action of *Guti*. Values obtained from quality control tests performed on *Guti* were within standard limits.

CONCLUSION

- Authentication of all herbs of *Talisadi Choorna* and *Guti* was done.

- Analysis of Synthetic *Vanshlochan* was done, thus complete physical and chemical data of the substance was generated.
- Standardized *Talisadi Choorna* and *Guti* were manufactured following standard operating procedures.
- Preparation of compressed tablets avoids size and weight variation, which occurs if *Guti* is prepared.

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