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PHARMACEUTICAL STUDY OF *VAJRA DANTA MANJANA* AND *VIDANGADI GUGGULU*- A POLY HERBAL MEDICINE

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ABSTRACT

Dantveshta is a chronic disease of gums in which there is pus mixed blood discharge from gums with loosening of teeth, due to vitiation of *Kapha Dosha* and *Rakta Dushti* in *Uttamanga*. The clinical features of *Dantaveshta* as explained in Ayurvedic literature have the relevance with Pyorrhoea Alveolaris. Pyorrhea Alveolaris can be known as periodontitis which is an inflammatory disease of the supporting tissues of the teeth. So the present study was carried out to standardize the finished product *Vajradanta Manjana* and *Vidangadi Guggulu* to confirm its identity, purity and quality. Physicochemical analysis of *Vajradanta Manjan* shows loss on drying 06.80%, total solid content is 93.20%, total ash 26.95%, Acid insoluble ash 03.36%, Water soluble Extractive 51.89%, pH 3.04, Thin Layer Chromatography showed 7and 7 Spots. Physicochemical analysis of *Vidangadi Guggulu* shows loss on drying is 04.83%, total solid content is 95.17%, total ash 06.33%, Acid insoluble ash 02.11%, Water soluble Extractive 34.07%, pH 3.90, average weight 532mg, Thin Layer Chromatography showed 7 and 8 Spots. This shows the presence of certain definite constituents in the *Vajradanta Manjana* and *Vidangadi Guggulu* and is helpful for the easy separation of these constituents.

KEYWORDS: *Dantaveshta*, Pyorrhoea Alveolaris, *Vajradanta Manjana*, *Vidangadi Guggulu*, HPTLC, Pharmaceutics.

INTRODUCTION

Dantveshta is a chronic disease of gums in which there is pus mixed blood discharge from gums with lossening of teeth, due to vitiation of *Kapha Dosha* and *Rakta Dushti* in *Uttamanga*.[1] The clinical features of *Dantaveshta* as explained in Ayurvedic literature have the relevance with Pyorrhoea Alveolaris. Pyorrhea Alveolaris can be known as periodontitis which is an inflammatory disease of the supporting tissues of the teeth,[2] and is characterized by as a simple marginal gingivitis in the beginning then a tiny ulceration of the crevicular epithelium, formation of periodontal pocket and atlast destruction of periodontal ligament and alveolar bone resorption[3]. Dantveshta is the *Kapha* dominant disease along with *Rakta Dushti*. So the ingredients of the selected drug were those which were having *Vata Kapha Shamaka* and *Tridoshamaka* properties. So the present study was carried out to analyze the physico-chemical properties of *Vajra Danta Manjana* and *Vidangadi Guggulu.*

MATERIALS AND METHODS

Collection of the drug raw drugs of *Vajra Danta Manjana*[4] and *Vidangadi Guggulu*[5] were procured from and were identified and authenticated at Pharmacognosy laboratory.

Table 1: Ingredients of *Vajra Danta Manjana*.

S. No.	Name Of Plant	Botanical Name	Family	Part Used	Quantity
1.	*Shunthi*	*Zingiber officinale*	Zingiberaceae	Rhizome	1 part
2.	*Maricha*	*Piper nigrum*	Piperaceae	Fruit	1 part
3.	*Pippali*	*Piper longum*	Piperaceae	Fruit	1 part
4.	*Haritaki*	*Terminalia chebula*	Combretaceae	Fruit pericarp	1 part
5.	*Vibhitaki*	*Terminalia bellarica*	Combretaceae	Fruit pericarp	1 part
6.	*Amalaki*	*Emblica officinale*	Combretaceae	Fruit pericarp	1 part
7.	*Patranga*	*Caesalpinia sappan*	Leguminosae	Extract	1 part
8.	*Mayaphala*	*Quercus infectoria*	Cupuliferae	Fruit	1 part
9.	*Tuttha*				1 part

10.	*Saindhava lavana*				1 part
11.	*Sauvarchala lavana*				1 part
12.	*Vida lavana*				1 part

Method of preparation of *Vajra Danta Manjana*
Shodhana of Tuttha

- *Shodhana* of *tuttha* is done in *nimbu swarasa* for 6 hours.
- The paste obtained after *mardana karma* was allowed to dry and then preserved.

Procedure

- Washed, dried and powdered the ingredients numbered 1 to 12 in table no 1 in equal quantity and passed through sieve no. 21 to obtain a fine powder.
- Packed it in tightly closed containers to protect from light and moisture.

Description

Reddish Brown, fine powder with Characteristic odour and Astringent and saline taste.

Table 2: Ingredients of *Vidangadi Guggulu.*

S. No	Name Of Plant	Botanical Name	Family	Part Used	Quantity
1.	*Vaya Vidanga*	Embelia ribes	Myrsinaceae	Fruit	1 part
2.	*Shunthi*	*Zingiber officinale*	Zingiberaceae	Rhizome	1 part
3.	*Maricha*	*Piper nigrum*	Piperaceae	Fruit	1 part
4.	*Pippali*	*Piper longum*	Piperaceae	Fruit	1 part
5.	*Haritaki*	*Terminalia chebula*	Combretaceae	Fruit pericarp	1 part
6.	*Vibhitaki*	*Terminalia bellarica*	Combretaceae	Fruit pericarp	1 part
7.	*Amalaki*	*Emblica officinale*	Combretaceae	Fruit pericarp	1 part
8.	*Guggulu*	*Commiphora mukul*	Byrseraceae	Saar	7 part

Method Of Preparation
Guggulu Shodhana

- Firstly *Shodhana* of *Guggulu* was done in *Trifala Kwatha* by *Dola Yantara Vidhi*.
- The mass was dried in tray dryer at 50°C and pounded with a pestle in a stone mortar.

Procedure

- Washed, dried and powdered separately the ingredients numbered 1 to 7 in table no 2 in equal quantity except Guggulu and passed through sieve no. 85 to obtain a fine powder.
- Fine powder of all the contents were mixed properly with the purified *Guggulu* of weight equal to the combined weight of all the ingredients along with *Ghrita*.
- And then *Vati* of 500mg were prepared in a tablet making machine.
- Packed it in tightly closed containers to protect from light and moisture.

Description

Dark brown, thick, hard tablets with Agreeable odour and bitter, astringent slightly pungent taste.

Test For Analysis

1. Macroscopic test
2. Physiochemical test
3. Identification test

Macroscopic Test

Macroscopic analysis were carried out by following parameters: Appearance, color, odor, taste.

Physiochemical Test

Physiochemical analysis were carried out by following parameers:

1. Ph value,[6] (1% aq. Soln.)
2. Loss on drying at 110°C,[7]
3. Average weight
4. Total solid
5. Total ash,[8]
6. Acid insoluble ash.[9]
7. Water soluble extractive.[10]

Identification Test

Identification test were carried out by following parameters:

1. Qualitative test
2. High Performance Thin Layer Chromatography (HPTLC)

Procedure Of Parameters

1. Ph value: This test is carried out to determine the ph of the test drug with the help of ph meter.

Procedure: Total 10gms of test drug sample was weighed and taken into the conical flask. Then add 50 ml accurately measured water and stirred well for few minutes. Keep this solution for some time and then filter it through filter paper. Take the filtered solution in a beaker. Standarized the ph meter and electrode with buffer solution of known ph i.e. 7 ph. Rinse the electrode

with distilled water and introduce into the test solution contained in a small beaker. Read the ph value of solution[11].

2. Loss On Drying: The moisture content of the drug should be determined to know the amount of moisture present in the drug. So the moisture content of the drug should be minimized in order to prevent the decomposition of the crude drug either due to chemical change or microbial contamination.

Procedure: 1gm of drug sample was taken in a pre-weighed dried petri dish. It was dried in an oven at 105°C reaching a constant weight. The petri dish was taken out, self- cooled and weighed immediately. The weight loss i.e. loss on drying was calculated and expressed as % w/w[12].

3. Average Weight: Twenty tablets were selected randomly and weighed on an analytical top loading balancing (FA 2104A). The weight of each tablet was determined using average weight of the 20 tablets.

4. Total Solid: The dry matter that remains after moisture removal is commonly reffered as total solids.

5. Total Ash: the total ash is the residue remaining after incrineration. The test was conducted to evaluate the %age of inorganic salts, carbonates, phosphates, silicates, etc. naturally occurring in the drug or adhering to it or deliberately added as a form of adulteration. Ash values are helpful in determining the quality and purity of the crude drugs in powder form.

Procedure: The ash value of the samples were determined according to IP'85.2gms accurately weighed sample was taken in a pre-weighed dried crucible. It was incinerated in a muffle furnance upto 650°C. The crucible was taken out, self- cooled and weight immediately. From the weight of the ash, the ash value was derived with reference to te air dried drug. It was calculated and expressed as % w/w.[13]

6. Acid Insoluble Ash: The acid insoluble ash is the part of the total ash which is insoluble in diluted HCL.
Procedure : Boil the ash for 5min in 25ml of HCL (approx.. 70g/l) TS; collect the insoluble matter in a sintered crucible, or on an ashless filter paper, with hot water, and ignite at about 500 degree Celsius to constant weight. Calculate the content in mg of acid insoluble ash per gm of air dried material.[14]

7. Water Soluble Extraction: The test was carried out to determine the water soluble extractive and approximate measures of their chemical constituents of the test drugs which are water soluble.

Procedure: 5 gm of sample was weighed accurately. 100ml of distilled water was added to it and kept coverd over night. It was stirred intermittently in the initial period. It was filterd after keeping for 24 hrs. 25ml of the filterate was accurately measured with the pippete and transferred to already weighed evaporating dish. The evaporating dish was placed on the water bath for evaporation of the water. After evaporation of the water it was dried in an oven, allowed to cooled and weighed immediately. From the weight of extract the percentage of water soluble extractive was expressed as % w/w.[15]

8. Qualitative Test: It is the chemical test for the screening and identification of bioactive chemical constituents like alkaloids, carbohydrates, glycosides, saponins, phenolic compound, protein, amino acid, flavonoids and tannins in the prepared drug. The method of harborne was adopted for the preliminary phytochemicals screening.

9. High Performance Thin Layer Chromatography:[16] High performance thin layer chromatography (HPTLC) is an invaluable quality assessment tool for the evaluation of botanical materials. It allows for the analysis of the broad number of compounds both efficiently and cost effectively. Additionally, numerous samples can be run in single analysis thereby dramatically reducing analytical time. With HPTLC, the same analysis can be viewed using different wavelengths of light thereby providing the more complete profile of plant than is typically observed with more specific types of analysis.

Procedure : First of all, take a drop of sample and dilute with haxen (as per require) then application of the sample at the one end of the precoated plate through linomat V (150µl/sec) sec) then on the sample zone again applied 7% alcoholic KOH then leave for 10-15 min at 60-80°C in oven. The plate is then developed by the suitable mobile phase. Then after development it is visualized into day light, short UV (254nm) and /or by derivatization of the plate with suitable reagent. The Rf values and the colors of the resolved band and fingerprinting profiles are recorded.

OBSERVATIONS AND RESULTS

Organoleptic Evaluation Various parameters of the material such as colour, odour, touch and taste of the *Vajra Danta Manjana* and *Vidangaadi Guggulu* were observed and recorded.

Table 3: Organoleptic characters of *Vajradanta Manjana.*

Sr.no.	Test	Result
	Macroscopic Test	
1.	Appearance	Powder
2.	*Rupa* (Color)	Reddish brown
3.	*Gandh* (Odor)	Characteristic
4.	*Rasa* (Taste)	Astringent and Saline

Table 4: Organoleptic characters of *Vidangadi Guggulu.*

Sr.no.	Test	Result
	Macroscopic Test	
1.	Appearance	Tablet
2.	*Rupa* (Color)	Dark brown
3.	*Gandh* (Odor)	Agreeable
4.	*Rasa* (Taste)	Bitter, astringent & slightly pungent

Analytical Study
Results of the analytical study of *Vajradanta Manjana* and *Vidangadi Guggulu* are as follows.
Physico-chemical Constants The results are depicted in (Table no: 5-6).

Table 5: Physico-chemical Constants of *Vajradanta Manjana*.

S.No.	Physio-Chemical Test	Result
1.	pH(1% aq. Soln.)	3.04
2.	Loss on drying	06.80%
3.	Total solid	93.20%
4.	Total ash	26.95%
5.	Acid insoluble ash	03.36%
6.	Water soluble extractive	51.89%

Table 6: Physico-chemical Constants of *Vidangadi Guggulu.*

S.no.	Physio-Chemical Test	Result
1.	pH(1% aq. Soln.)	3.90
2.	Average weight	532 mg
2.	Moisture content	04.83%
3.	Total solid	95.17%
4.	Total ash	06.33%
5.	Acid insoluble ash	02.11%
6.	Water soluble extractive	34.07%

High Performance Thin Layer Chromatography (HPTLC).
In HPTLC, 7, 7 spots were observed in *Vajradanta Manjana*. In HPTLC, 7, 8 spots were observed in *Vidangadi Guggulu*.

Table 7: Chromatographic results of *Vajradanta Manjana.*

Thin layer chromatography	Rf. Values: 0.14,0.17, 0.32, 0.38, 0.46, 0.64, 0.71 0.15, 0.26, 0.34, 0.38, 0.53, 0.65, 0.84

Table 8: Chromatographic results of *Vidangadi Guggulu*.

Thin layer chromatography	Rf. Values: 0.09, 0.21, 0.30, 0.40, 0.53, 0.73, 0.86 0.09, 0.23, 0.54, 0.63, 0.70, 0.73, 0.80, 0.86

CONCLUSION

Results obtained in Physiochemical parameters of *Vajradanta Manjana* and *Vidangadi Guggulu* are with in limits mentioned by Ayurvedic Pharmacopia of India. HPTLC profile of *Vajradanta Manjana* and *Vidangadi Guggulu* showed similar in number of spots. This profile can be used for the identification of the medicinally important formulation of *Vajradanta Manjana* and *Vidangadi Guggulu*. Present work can be considered as the first step towards identifying the following methods through HPTLC analysis. This is the preliminary analysis and meticulous nature along with depiction is to be carried out.

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