



PHARMACOGNOSTICAL AND PHYTOCHEMICAL EVALUATION OF SHILAJATU VATAK - AN AYURVEDIC POLYHERBAL FORMULATION

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ABSTRACT

Shilajatu vatak, a polyherbal Ayurvedic formulation is recommended in the management of Madhumeh . There has been an increase in demand for the Phyto-pharmaceutical products of Ayurveda so a pharmaceutical preparation in the form of Shilajatu vatak was tried to standardize, which is economical in terms of time and machinery usage, till date there no reference regarding evaluation of Shilajatu vatak. In the present study Shilajatu vatak subjected to confirm its quality and purity, Pharmacognostical and phyto-chemically. Results revealed the specific characters ie. fibres, fragment of spongy parenchyma, tannin, fibers, sclerides, stone cells trichomes, oleo resin, silica deposition crystal, rosette crystal, latex content, Aluerone grains, fibres, epicarp cells. Physicochemical results showed that pH 5.0, Water soluble extract 40% w/w, support the intended action of the formulation in Diabetic polyneuropathy.

Keywords: Shilajatu vatak, Madhumeha, Pharmacognosy, Phyto-chemistry.

INTRODUCTION

Ayurveda is the oldest holistic management system with meticulously documented medicines and being practiced by a large population in India and abroad. The development of this traditional system of medicines with perspectives of safety, efficacy and quality will help not only to preserve the traditional heritage but also to rationalize the use of natural products in health care.^{[1][2]}Diabetic Mellitus (DM) is a most widespread disease in existence. As the civilization developed, lifestyle disorders evolved as a negative effect. Diabetes has got a prime place among them according to WHO, an estimated 285 million people of world's adult population, live with Diabetes Mellitus till 2010, The number is expected to be 438 million by 2030.^[3.1] In India alone, the prevalence of diabetes is expected to increase from 31.7 million in 2000 to 79.4 million in 2030^[3.2]. WHO has declared India as the "Diabetic capital of the World ^[3.3]"

The American Academy of Family Physicians (AAFP) reports that this is characterized by Distal, bilateral, symmetrical, loss of sensation in a "stocking – glove" pattern, affecting the longest nerves first, starting with toes and feet, and spreading towards the trunk, It usually presents with sensory symptoms, which range from numbness("deadness") to severe pain. Burning, alterations of temperature sensation, parathiasias, and shooting, or stabbing pains are common. Pain may worsen especially at night. And in other hand, it decreases the quality of life of the patients^[4]. These conditions are thought to result from diabetic micro vascular injury involving small blood vessels that supply nerves (Vasanervorum) in addition to the macro vascular complication that can culminate in DPN. All these are the result of metabolic derangements contributing to Hyperglycaemia, which in turn causes increased production of superoxide, as a result of oxidative stress. Due to excessive production superoxide, the enzymes like superoxide dismutase etc., fail to neutralize. Thus their excess accumulation, contribute to neuronal ischemia by activating the four major pathways of hyperglycaemic damage.

The direct comparison of Diabetic neuropathy is not available in Ayurvedic texts. On review of previous research works, many scholars have coined this disease by various names such as MadhumehaJanyaUpadrava, TwakgataVata, Jhinjhivata, Vatanadi Pradhana Shotha etc., The explanation of symptoms are scattered in the Purvarupa and Upadravas of Madhumeha.

In Prameha, the manifestation of the disease to a mild or severe form is dependant mainly on the degree of Dosha dushya Sammurchana by the Nidana^[5] Madhumeha, is one of the Vataja pramaeha, which involves three Doshas and Dash Dushyas, where Chakrapani explains the involvement of all these Dushyas are seen from the initial stage of Samprapti itself^[6]. As the disease progresses the involvement of Dushyas like Majja gets evident to a greater extent. The excess of Meda involvement in the very pathogenesis attributed to the excess increase of Bahudrava Kapha in Madhumeaha due to Gunasadharmyata^[7] and thereby excess Abaddhameda. Abaddhameda results in medodhatwagnimandya, which in turn leads to uttarottara

dhatukshaya^[8], ie., affecting the formation of majjadhatu. As a result, further Vataprakopa, due to excessive Dhatukshaya, which initiates the nerve injury.

DM is caused by spectrum of diverse etiologies resulting in Chronic Hyperglycemia and complication attribute to it. Principally this is a metabolic disorder with variable clinical manifestation and progression, majority of the cases are detected after the manifestation of complications.

The present study is planned to segregate the pathology of this malady by the drugs, which possesses pramehaghna, kaphamedahara, srotoshodhana and Rasayana property. Shilajatu vataka^[9], prepared after giving Bhavana to shilajatu, from the kashaya prepared out of Kutaj, Triphala, Nimba, Patola, Musta and Sunthi. The drug possess Chhedana, Medoghna, Neuro protective, Rasayana property, Mutradoshahara quality. For the first time reporting on the standardization of Shilajatu vatak, based on organoleptic, microscopic, physico-chemical, phytochemical parameters and HPTLC study.

MATERIAL AND METHODS

Collection of the drug:

Shilajatu vatak ingredients have been collected from the Pharmacy, I.P.G.T.& R. A. G.A.U., Jamnagar. The ingredients and the part used are given in (Table no.1)

Pharmacognostical Evaluation:

As per API^[10] raw drugs were identified and authenticated by the Pharmacognosy Lab. The identification was carried out based on the organoleptic features and powder microscopy of the individual drugs. Later, pharmacognostical evaluation of Shilajtu vatak was carried out. Vatak dissolved in small quantity of distilled water, studied under the Carl zeiss trinocular microscope attached with camera, with stain and without stain. The microphotographs were also taken under the microscope.

Preparation of Shilajtu vatak:

Shilajatu vatak was prepared in the Pharmacy of Rasashastra dept I.P.G.T. & R.A GAU, Jamnagar.

Method of Preparation:

The kwatha prepared out of Kutaj, Triphala, Nimbatwak, Patola patra, Nagaramotha and Shunthi, according to kwatha nirman vidhi, and then ten times Bhavana given to Shilajatu. Afterwards, mix with eight Pala churna of Mishri, Vamshalochana, Pippali churna, Amalaki, Karkataka Shringi again mix the Trisugandha to this mixture, each one Karsha Pramana, and three

Pala madhu to be mixed well and Vati prepared of the size of one Karsha.

Weight of each Vati About 500 gm. Shape: Round shape Size:About 0.5 cm,bit yellow in colour with specific odour, Hard to touch. Storage: kept in well closed polythene bags. Ingredients of Shilajatu vatak are as shown in (Table no. 1)

Sr.	Sans. Name	Botanical name	Part used	Quantity
1	Shilajatu (Black bitumen)	Asphaltum punjabinum		320 gms
2	Kutaja	Holarrhena antidysentrica (L.)Wall.	Root bark	240 gms
3	Nimba	Azadiracta indica A. Juss.	Stem bark	40 gms
4	Patola	Trichosanthes cucumerina Linn.	Patra	40 gms
5	Mishreya	Foeniculum vulgare Mill.	Fruit	636 gms
6	Pippalimoola churna	Piper longum L.	Root	636 gms
7	Twak	Cinamomum zeylanicum Bl.	Stem bark	40 gms
8	Ela	Elatetteria cardamom Maton.	Fruit	40 gms
9	Patra (Teja)	Cinamom tamala Nees.	Leaves	40 gms
10	Karkatakashringi	Pitacia integerrima	Galls	106 gms
11	Hareetaki	Terminalia chebula Retz.	Fruit	240 gms
12	Bibhitaki	Terminalia belerica Roxb.	Fruit	240 gms
13	Amalaki	Emblica officinalis Gaertn.	Fruit	240 gms
14	Shunthi	Zinziber officinale Rose.	Rhizome	106 gms
15	Musta	Cyprus rotandus L.	Tuber	40 gms

Table 1: Ingradients of Shilajatu vatak

This Vati was analyzed using various standard physicochemical parameters such as, Loss on drying^[11], PH,^[12] water soluble extract,^[13] and methanol soluble extract ^[14]as per APIat the

pharmaceutical chemistry lab, IPGT & RA.

OBSERVATION & RESULTS

Organoleptic parameters:

Organoleptic parameters like Taste, Color, Odor and touch were scientifically studied and results were depicted in the table. (Table 2)

Characters	Results
Taste	Kashaya, Katu
Color	Yellowish brown
Odor	Characteristic
Touch	Hard

Table 2: Organoleptic parameters of Shilajit vata

Shilajitu vatak subjected to pharmacognostical evaluation was carried out microscopical characters showed that the presence of tannin, fibers, sclerides, oleo resin content of Shunti, rhomboidal crystal of Nimba, prismatic crystal of Kutaj, tannin content of Karkatak shringa, stone and epicarp cells of Haritaki, latex content of Kutaj, unicellular blunt trichome of Bibhitaki, stone cells of Twak, simple fibres of Patola, perisperm cells of Ela, fragment of spongy parenchyma and oil globules of Patra, starch grains of Pippalimoola, fragments of pitted vessels of Pippalimoola, Aloerone grains stratified cells of Mishrya, rosette and prismatic crystals of calcium oxalate of Nimba. (Photo Plate 1)

Physico-Chemical Parameters:

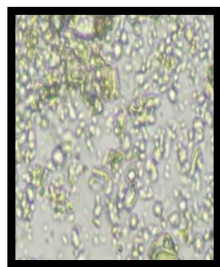
Physico-Chemical parameters of the Shilajatu vatak like PH, Loss on drying, water soluble extract, and methanol soluble extract were all found to be within the normal range. (Table.3)

Analytical Study:

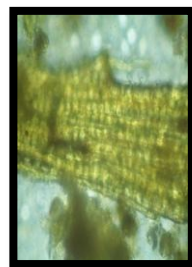
The loss on Drying, ash value, hardness, soluble extractive values were scientifically studied and the values are depicted in the table no. 3.

Parameters	Shilajatu Vataka
Loss on Drying at 110° c	6.837 % w/w
Ash value	7.207 % w/w
Hardness	2.09 kg/mtr ²
Water soluble extractive	40 % w/w
Methanol soluble extractive	29.6 % w/w
pH value	5.0
Acid insoluble ash	3.34 % w/w

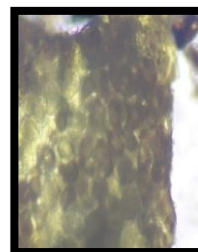
Table 3: Physico-Chemical parameters of the Shilajatu vataka



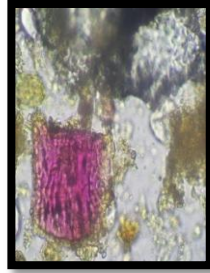
Alooerone grains of
Mishrya



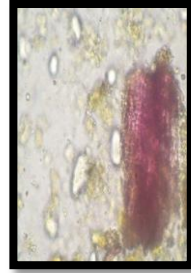
Crystal fibre of
Nimba



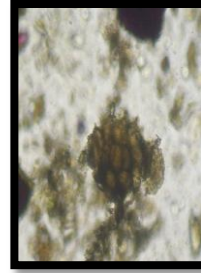
Epicarp cells of
Haritaki



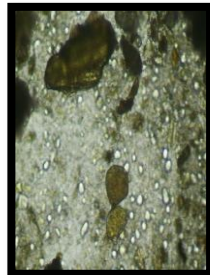
Fragment of pitted vessels of Karkatak - srungi



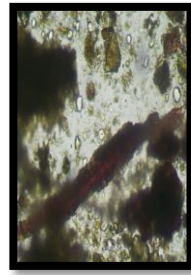
Fragment of pitted vessels of Pippali moola



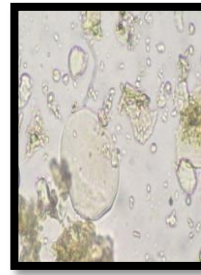
Fragment of spongy parenchyma of Patra



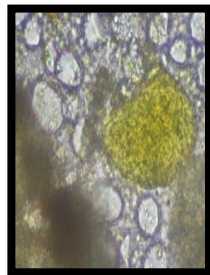
Latex content of Kutaja



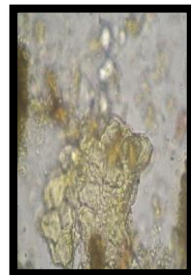
Lignified fibres of Twak



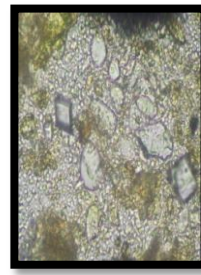
Oil globules of Patra



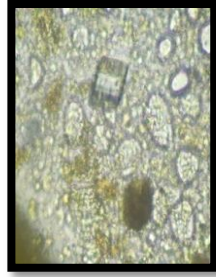
Olioresine of Shunti



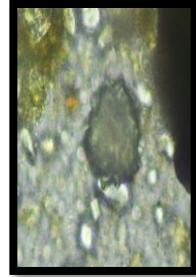
Perisperm cells of Ela



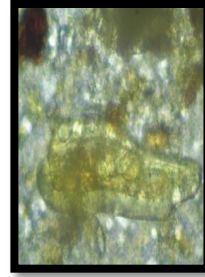
Prismatic crystal of Kutaja



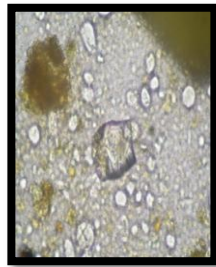
Rhomboidal crystal
of Nimba



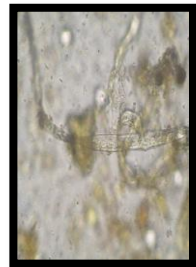
Rosette crystal of
Bibitaki



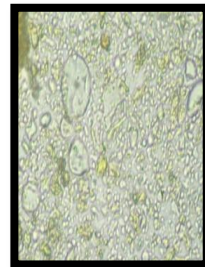
Scleroids of Bibitaki



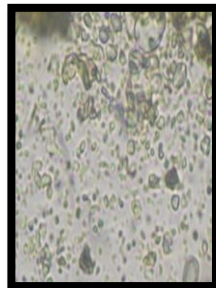
Silica deposition of
Amalaki



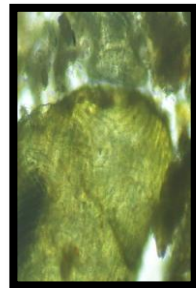
Simple fibres of
pataola



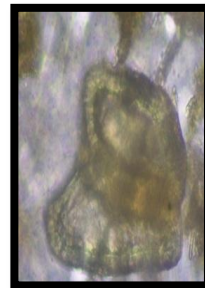
simple starch grains
of Musta



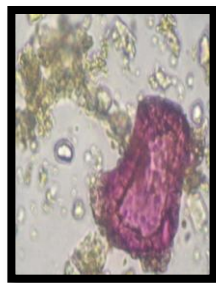
Starch grains of
Pippli moola



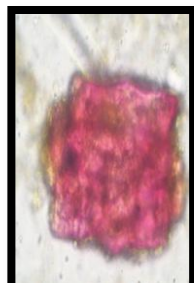
Stratified fibres of
Myshrya



Stone cells of
Haritaki



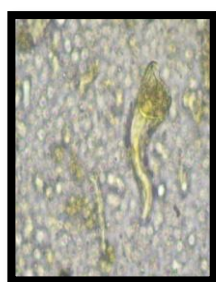
Stone cells of Pippali



Stone cells of Twak



Tannin content of
Karkatak shrungi



Trichome of Vibitaki

Plate 1: Microphotographs of Shilajatu vataka

DISCUSSION

Pharmacognostical evaluation of Shilajtu vatak showed the specific characters of all the ingredients which were used in the preparation this showed that the quality of the finished product Shilajatu's prabhava is Rasayana. The Rasayanas act like conservators of glucose utilization, potentiate oxygen delivery systems, improves cell membrane permeability^[15], anti-oxidants. Rasayana like free radical scavengers can be used to target mitochondrial activity, neurotransmitter synthesis and degradation, accumulation and removal of modified lipids and proteins, intracellular Ca^{2+} concentration, Oxidative stress. Patola acts as a tridosha hara, where as Madhumeha is of Vata predominance, so helps in mitigating the vitiated vata pradhana tridosha, Kutaj, Mishreya, Ela possess tikta, katu and kashaya rasa and katu vipak hence acts as Agni Deepak, there by increases bio availability to the tissues, so only Dhatu poshana takes place. Which is essential in rectifying dhatu kshaya. Dhatu kshaya is one of the causes of vata prakop, this is how vata can pacified in Madhumeha.

The quantitative pharmaceutical analysis was in normal range and in accordance with those mentioned in reference. Shilajatu vatak contain these phytochemical on qualitative analysis.

CONCLUSION

Pharmacognostical findings confirm the ingredients present in the finished product and there is no major change in the microscopic structure of the raw drugs during the pharmaceutical processes of preparation of kwatha churna. The results of this study may be used as the reference standard in further research undertakings of its kind. **Acknowledgement:**

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