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## Pharmacognostical and Pharmaceutical Evaluation of *Shalaparni* Granules

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### ABSTRACT

The event of male infertility in any person's life, often makes him turn towards traditional medicine. Ayurveda is having high esteem and trust in this field. *Shalaparni* (As per API *Desmodium gangeticum* DC) is mentioned in *Agraya-prakarna* by Acharya Charaka for *Vrshya-karma*. Here *Shalaparni* granules were prepared to increase the palatability and shelf life of the drug. An effort has been made in this paper to scientifically review and explain the Pharmacognostical and Pharmaceutical characteristics of *Shalaparni* granules hypothetically.

**Aim:** The aim of the present study was to setting up a standard profile of *Shalaparni* granules which was prepared subjecting it to detail of pharmacognostical features, physicochemical features and phytochemical features evaluation. **Materials and Methods:** Raw drugs of *Shalaparni* were collected from the Rajpipla Govt. pharmacy, Gujarat. Identification and authentication of *Shalaparni* granules were performed at Pharmacognosy Laboratory, I P G T & R A, Jamnagar. *Shalaparni* granules were prepared at laboratory of *Rasashasta* and *Bhaishajyakalpana* Department of the Institute. **Results:** Result of Pharmacognostical study shows that the presence of Parenchymal cell, Starch grains, Fragment of trichome with brown content, Stomata with epidermal cells, Group of lignified Vessels, Annular vessel, Fragment of Lignified annular vessel, Border pitted vessel, etc. Pharmaceutical analysis showed 5.066% w/w loss on drying, total Sugar content 54.1 %, pH 7. HPTLC study showed 10 spots at 254 nm and 2 spots at 366 nm. **Conclusion:** The findings of the study will be useful in the identification and standardization of the *Shalaparni* granules.

### KEYWORDS

*Shalaparni* granule, Pharmacognosy, Pharmaceutics, Oligozoospermia, Ayurveda



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## INTRODUCTION

Prevalence of infertility changes across the different regions of the whole world and conception is depending on the fertility-potential of male & female both the partner. Males are responsible for about 30–40 % of infertility cases<sup>1</sup>. Male infertility affects the person's mentality, his social behavior and also a feeling of incompleteness due to inability to make a progeny. Thus a male infertility person is not fully fit as per the WHO definition of health i.e. mental, physical and social wellbeing. Thus unable to fulfil the *Purasharth Chtustaya* because *Aarogya* (Health) is the root of this *Chatustaya* which is the aim of life<sup>2</sup>. Oligozoospermia is the main cause of male infertility. *Vajikarana* is a branch of *Astanga Ayurveda*, in Ayurveda classics various *Vajikarana* drugs are mentioned as single or as compound drugs. *Charaka Samhita* is the prime text of Ayurveda, in which *Shlaparni* (*Desmodium gangeticum* DC) is mentioned as the best best *Vajikarana* drug<sup>3</sup>. So *Shlaparni* granules are taken for the management in this study. As a part of the research protocol Pharmacognosy and Pharmaceutical analytical study are also conducted, so here data is collected and evaluated. Here an attempt is made attempt is made here to

produce some standard data for the future studies.

*Shlaparni* granules have also been indicated in several other conditions as per classic texts which are mentioned below.

- a) **Cardiac pain:** *Shlaparni* boiled with milk is efficacious in cardiac pain<sup>4</sup>.
- b) **Raktapitta:** *Shlaparni* with *Mudgarasa* in *Ahara*<sup>5</sup>.
- c) **Vatarakta:** *Shlaparni*, *Prasniparni* boiled with milk should be taken<sup>6</sup>.
- d) **Pediatric diseases:** Decoction prepared from *Shlaparni*, *Prishniparni* and *Puga* bark and mixed with honey pacifies three *Doshas* and checks all types of diarrhea<sup>7</sup>.

**Other uses:** *Jvara* (fever), *Meha*, *Arsa* (hemorrhoids), *Chardi* (vomiting), *Sopha* (swelling), *Swasa*, *Kasahara* (Cough), *Krimi*, *Rajayakshma*, *Netra Roga*, *Hridaya Roga* (Heart Diseases), *Rakta Gata Vata*, *Vata Ardhavbhedaka*, *Mudha Garbha*<sup>8</sup>.

**Aim:** To setting up a standard profile for *Shlaparni*-granules by detailed pharmaceutical and pharmacognostical evaluation.

## MATERIALS AND METHODS

**Collection of raw drugs:** Raw drugs *Shlaparni* was collected from the Rajpipala, Gujarat. *Shlaparni* granules



were prepared in the RS & BK Department laboratory of the I P G T & R A, Jamnagar. The ingredients and parts used in the preparation of the final products are listed in Table No.[1]

**Pharmacognostical study:** *Shalaparni* granules were observed and authenticated by the Pharmacognosy department of the institute, As per API<sup>9</sup>. The identification of Drug was done on the basis of morphological features, organoleptic features and powder microscopic features of the finished products. Here, pharmacognostical evaluation of *Shalaparni* granules was carried out. First granules were dissolved in distilled water and then a slide were made by with glass slide and cover slide then slide were observed under the Carl Zeiss Trinocular microscope. The microscope was attached with a camera. Then first photographs of *Shalaparni* granules slide (finished products) were taken without staining and after that with-staining (phloroglucinol and HCl staining) micro-photographs were taken.

**Organoleptic Study:** *Shalaparni* granules were observed for the organoleptic characters like test, color, odor, and touch at the pharmacognosy laboratory of the institute. These all are very important features because they give general idea about the genuineness of the sample.

### **Pharmaceutical Evaluation:**

**Physico-chemical parameters:** Important Physicochemical parameters (as per API) like: percentage loss-on-drying of the end product<sup>10</sup>, pH<sup>11</sup> of the granules, percentage water-soluble-extract<sup>12</sup>, percentage methanol-soluble-extract<sup>13</sup>, percentage Sugar-estimation<sup>14</sup>, percentage total-ash-value of the granules<sup>15</sup>, *Shalaparni* granules were analyzed at the institutional pharmacognosy laboratory

**High-Performance-Thin-Layer Chromatography (HPTLC):** HPTLC study was performed according to the guidelines provided by API. Methanol soluble extract was prepared and then it was used for the spotting. HPTLC was performed using Toluene: Ethyl acetate (9:1 v/v) solvent system and observed under short UV (254 nm) and long UV (366 nm). Then the color and the R<sub>f</sub> values of resolved spots were noted. Analytical study of *Shalaparni* granules has showed 10 spots at 254 nm and 2 spots at 366 nm.

## **RESULTS**

**Microscopic characteristics of *Shalaparni* granules:** Microscopic evaluation of *Shalaparni* granules was conducted and microphotographs were taken as seen in Plate 1, in which Fig. - 1.1 shows *Churna* (powder) of *Shalaparni* granules, Fig. - 1.2 Simple starch grains,



Fig. - 1.3 Iodine stained simple starch grains, Fig. - 1.4 Compound starch grains seen, Fig.-1.5 Fragment of trichome, Fig. - 1.6 Fragment of trichome with brown content, Fig.-1.7 Parenchymal cells, Fig. - 1.8. Stomata with epidermal cells, Fig.-1.9 Group of fibers, Fig- 1.10 Group of lignified Vessels, Fig- 1.11 Annular vessel, Fig. - 1.12. Fragment of Lignified annular vessel, Fig. - 1.13 Border pitted vessel, Fig. - 1.14 Pollen grain with Brown content, Fig. - 1.15 Prismatic crystal and Fig. - 1.16 Rhomboidal crystals. Organoleptic characters of the *Shalaparni* Granules are shown in table no. 2,

**Physico-Chemical parameters** of the *Shalaparni* granules like pH, Loss on drying, water soluble extract, and methanol (Alcohol) soluble extract all were found within the normal range. Details of physicochemical parameters are mentioned in Table-3.

**HPTLC profile** of methanolic extract of *Shalaparni* granules was done and details of number of spots and R<sub>f</sub> value are given in Table-4 and HPTLC profile is given in Plate-2, in which Fig. 2.1 showing HPTLC: Densitogram at 254 nm, Fig. 2.2 HPTLC: Densitogram at 366 nm, Fig.2.3 HPTLC: visible light, Fig. 2.4 HPTLC: Short UV (254 nm), Fig. 2.5 HPTLC: Long UV (366 nm), Fig. 2.6 3D graph at multiple wavelength.

## DISCUSSION

Pharmaceutical properties of *Shalaparni* granules had to be studied; hence the formulation was subjected to minimum Pharmacognostical and Pharmaceutical analysis. Pharmacognostical evaluation of *Shalaparni* granules showed the specific characteristic features found in microscopy such as simple starch grains, iodine stained simple starch grains, compound starch grains, fragments of trichome, with brown content, parenchymal cells, stomata with epidermal cells, group of fibers, group of lignified vessels, annular vessel, fragment of lignified annular vessel, border pitted vessel, pollen grain with brown content, prismatic crystal, rhomboidal crystals were found having similar appearance as API standard of *Shalaparni*<sup>16</sup>. Ash value was 2.22 % which illustrates minimum chances of adulteration in *Shalaparni* granules.

Extractive values are used for determination of the authenticity and purity of the sample, in this study *Shalaparni* granules were having 84.41 % water-soluble extract and 90.32 % alcohol-soluble extract, which confirms that the good quality of *Shalaparni* was taken for the study. There is a very important role in extractive value in the evaluation of crude drugs. Less extractive value of crude drugs



reflects the presence of exhausted material and improper processing during drying or storage of the raw drug or adulteration of another material<sup>17</sup>. In the present study, alcohol-soluble extract value of the *Shalaparni* granules was higher than water-soluble extractive value. So *Shalaparni* granules constituents were more extracted in alcohol and solubility of the granules were more in alcohol in comparison to water. Loss on drying value was 5.08 %, in the present study moisture content of *Shalaparni* granules was low. Herbal drugs which having low moisture content having higher stability because moisture provides a suitable environment for the growth of the microorganism which causes deterioration of the drugs and its formulations. *Shalaparni* granules are having good stability in the present study due to its low moisture content.

## CONCLUSION

The Pharmacognostic study confirms that all proper characteristics were found in ingredient drugs of *Shalaparni* granules. In this study physicochemical analysis of *Shalaparni* granules reflects that the formulation meets maximum qualitative-standards of API at the preliminary level. All of the parameters and features observed and discussed here may be useful as

identifying tools for the quality assessment of *Shalaparni* granules. The results of this study may be used as a reference standard in further research undertakings of its kind.



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