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SCIENTIFIC EVALUATION OF *VALLI PANCHMOOLA* – DIFFERENT COMPOSITIONS THROUGH PHARMACOGNOSTICAL AND PHYTOCHEMICAL METHODOLOGY

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ABSTRACT: Objective: This study aimed at ensuring the different compositions of *Valli panchmoola* using authentic herbs and establishing pharmacognostical, physicochemical, and phytochemical standards for the compositions. **Methods:** Compositions of *Vallli panchmoola* were prepared as per the formula and procedure mentioned in traditional texts and Ayurvedic Formulary of India. The prepared compositions were evaluated for pharmacognostical, physicochemical, and phytochemical parameters using guidelines of the World Health Organization and Pharmacopoeial Laboratory for Indian Medicines for quality control of herbal drugs. **Results:** Microscopic studies revealed the presence of collenchyma cells, rosette crystals, compound starch grains, parenchyma cells, cluster crystal, *etc*. Loss on drying 0.17 ± 0.01%, total ash 1.87 ± 0.02%, *etc*. were observed in the classical group. Whereas loss on drying 0.10 ± 0.04%, total ash 1.77 ± 0.02%, *etc*. were observed in group-1. Preliminary phytochemical screening confirms the presence of alkaloids, flavonoids, glycosides, fatty acids, terpenoids, sterols, tannins, proteins, and phenolic compounds. **Conclusion:** The various pharmacognostical, physicochemical, and phytochemical standards will help in quality control/quality assurance and maintaining batch to batch consistency in herbal drug industries so that maximum therapeutic efficacy can be achieved.

INTRODUCTION: Over two decades ago, Hippocrates, the founder of medicine, described 400 medicinal plants and advised: "let food be your medicine and let medicine be your food [1]." Herbal drugs play an important role in health care programs, especially in developing countries. Ancient Indian literature incorporates a remarkably broad definition of medicinal plants to be potential sources of medicinal substances [2].

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Plants have been regarded as the primary source of secondary metabolites showing fascinating biological actions. Normally, these chemical constituents are the chief sources of some structural preparations and properties [3]. For centuries, plant and plant products have been used for treating various illnesses.

Today, several medicinal plants and their products are still in use, being employed as home remedies, over the counter drugs as well as raw materials for the pharmaceutical industry and they represent a substantial proportion of the global drug market [4]. However, a key obstacle, which has hindered the acceptance of the alternative medicines in the developed countries, is the lack of documentation and stringent quality control.

There is a need for documentation of research work carried out on traditional medicines [5]. Therefore, it has become extremely important to make an effort towards standardization of the plant material to be used as medicine. Stepwise pharmacognostical studies can achieve the process of standardization. These studies help in identification and authentication of the plant material. Correct identification and quality assurance of the starting materials is an essential prerequisite to ensure reproducible quality of herbal medicine which will contribute to its safety and efficacy [6]. *Valli panchmula* is an Ayurvedic formulation which is mentioned under "Mishrak gana." It is said to be useful in arthritis, inflammations, Soth, *etc*. The present study was designed to investigate the pharmacognostical and photochemical properties of different compositions of *Valli panchmoola*.

MATERIALS AND METHODS:

Collection of Plant Material and Authentication: Fresh roots/rhizome/stolon of meshshringi (*Daemia extensa* R. Br.) and haridra (*Curcuma longa* L.) were collected from Jamnagar in the month of May 2017. Where meshshringi (*Gymnema sylvestre*) root was collected from fields of Alwa Pharmacy, Moodbidri, in the month of Septmber 2017. Fresh roots/rhizome/stolon of vidari (*Purerea tuberosa*) in June 2017, guduchi (*Tinospora cordifolia*) was collected in July 2017 and sariva (*Hemidesmus indicus*) were collected from a forest area of Junagadh and in October 2017.

All were first washed with tap water then few pieces of roots/rhizome/stolon were stored in a solution of AAF (70% ethyl alcohol: glacial acetic acid: formalin) in the ratio of (90: 5: 5) to utilize them for microscopic studies whenever needed. The plant specimen was identified and authenticated at Pharmacognosy Lab., I.P.G.T. & R.A., Gujarat Ayurved University, Jamnagar with specimen number Phm/6237/Nov.2017, Phm/6239/ Nov.2017, Phm/6240/Nov.2017, Phm/6242/Nov. 2017, Phm/6241/2017, Phm/6238/2017 respectively.

Chemical and Reagents:

Microscopic Evaluation: Phloroglucinol + hydrochloric acid (HCl) and Iodine as staining agents.

Physicochemical Parameters: For acid insoluble ash; Hydrochloric acid (HCl) was used and for alcoholic extractive values; methanol and chloroform were used.

Qualitative Analysis: Molish's regent, Fehling's reagent, $FeCl_3$, Dragendroff's reagent, lead acetate, ninhydrin reagent, *etc*. were used for their respective tests.

Preparation of Compositions: It is done by taking all the following ingredients in equal proportions (1 part each) passing through 60 # and divided into two groups;

Common Ingredients: Vidari kand (*Pureria tuberosa*) (Wild.) DC., sariva (*Hemidesmus indicus*) (L.) R. Br., guduchi (*Tinospora cordifolia*) (Thunb.) Miers, haridra (*Curcuma longa*) (L.).

Classical Group (C.G.): Common ingredients + Meshashringi *(Gymnema sylvestre)* (R.Br.)

Group 1: Common ingredients + Meshashringi (*Daemia extensa*) (R. Br.)

Microscopic Evaluation: Different compositions of *Valli panchmoola* were evaluated for microscopic features with distilled water, then stained with suitable staining reagents (Phloroglucinol + HCl, Iodine) and examined to assess the different cell structure and content. The samples were observed under coral Zeiss Trinocular microscope with camera [7, 8].

Preparation of Plant Extract: 5 g powder of each sample (classical group & group-1) was macerated with 100 ml water in a closed flask for twenty-four hours, frequently shaking during six hours and allowed to stand for eighteen hours. After twenty-four hours samples were filtered and water extract was collected. Methanolic and chloroform extracts were also prepared by following the same procedure. All three extracts were used for preliminary phytochemical screening [9].

Determination of Physicochemical and Phyto-chemical Evaluation: The compositions were subjected for determination of color, odor and taste were recorded separately through visual and sensory perceptions [10]. Physicochemical parameters [11], preliminary phytochemical investigations [12] were conducted on samples. Phytochemical screening was carried out for the detection of secondary metabolites such as tannins, alkaloids,

flavonoids, terpenoids, steroids, and saponins [13]. All determinations were performed in triplicate, and the results are presented as mean values.

RESULTS:

Microscopic Evaluation: Compositions of *Valli panchmoola* were obtained as a rough, fibrous, creamish yellow, strong aromatic with bitter, astringent taste (classical group) and rough, fibrous, yellowish cream, slightly aromatic with bitter, astringent taste (group-1) **Table 1**. The microscopic results show, *i.e*. collenchyma cells of guduchi, oil globule of meshshringi (*Gymnema sylvestre*), paranchyma cells of haridra, border pitted vessel of sariva, a rhomboidal crystal of sariva, brown content of vidari, starch grain with hilum of vidari in the classical group.

Whereas in group-1 cork in tangential view of haridra, parenchyma cells of haridra, brown content of vidari, simple fibers of vidari, parenchyma cells of guduchi, cork in surface view, compound starch grains of sariva, group of pitted fibers, laticiferous cells of meshshringi (*Daemia extensa*) were observed **Fig. 1** and **Fig. 2**.

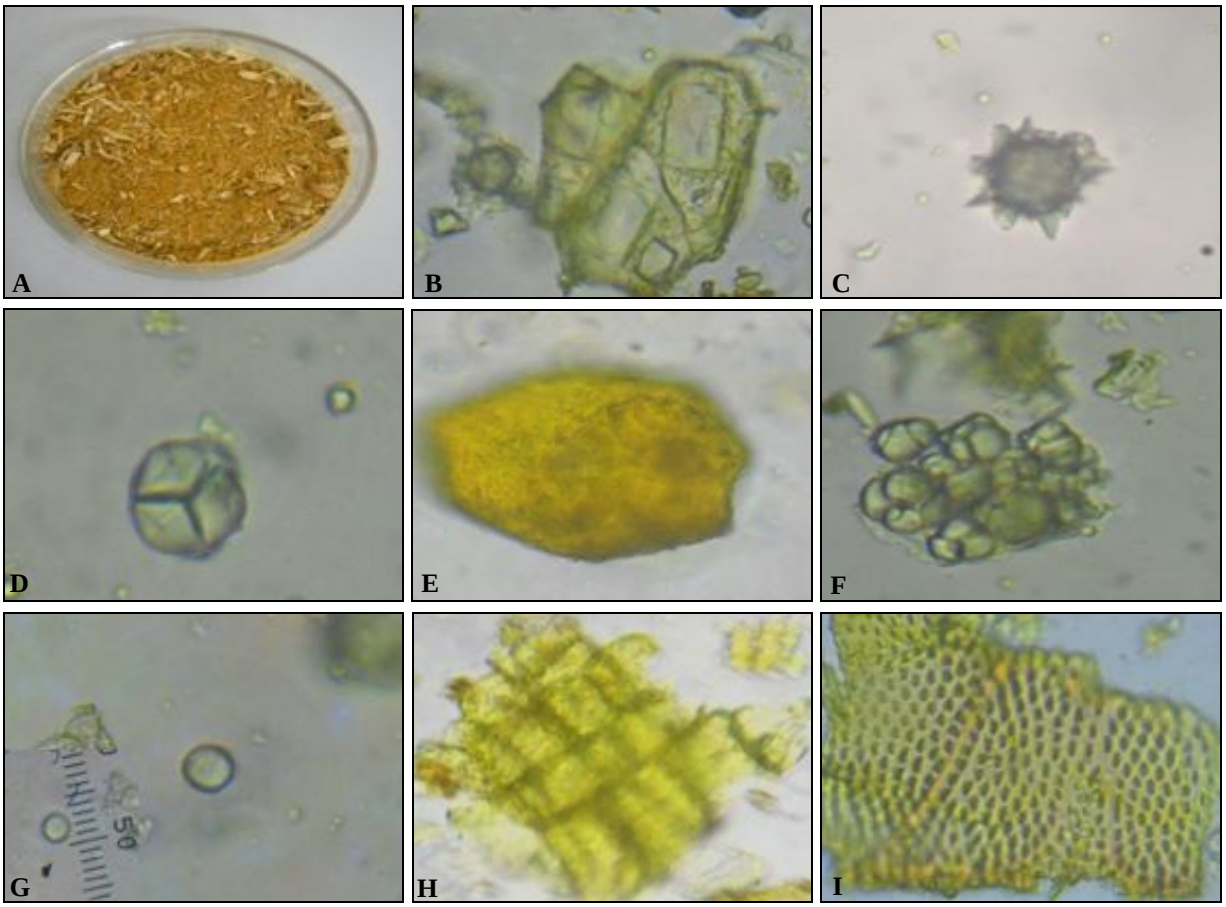

FIG. 1: A) POWDER OF CLASSICAL GROUP, B) COLLENCHYMA CELLS OF GUDUCHI, C) CLUSTER CRYSTAL OF MESHSHRINGI *(GYMNEMA SYLVESTRE),* D) COMPOUND STARCH GRAIN WITH HILUM OF VIDARI, E) PARANCHYMA CELL OF HARIDRA, F) COMPOUND STARCH GRAIN OF SARIVA, G) OIL GLOBULE OF VIDARI, H) FIBERS PASSING THROUGH MEDULLARY RAYS OF MESHSHRINGI (*GYMNEMA SYLVESTRE*), I) LIGNIFIED BORDER PITTED VESSEL OF SARIVA

TABLE 1: ORGANOLEPTIC CHARACTERS OF COMPOSITIONS

	Observation	
Characters	**Classical Group**	**Group – 1**
Color	Creamish yellow	Yellowish cream
Odor	Strong aromatic followed by Astringent	Slightly aromatic followed by Astringent
Taste	Bitter, Astringent (++)	Bitter, Astringent (+)
Texture	Fibrous, rough	Rough, fibrous

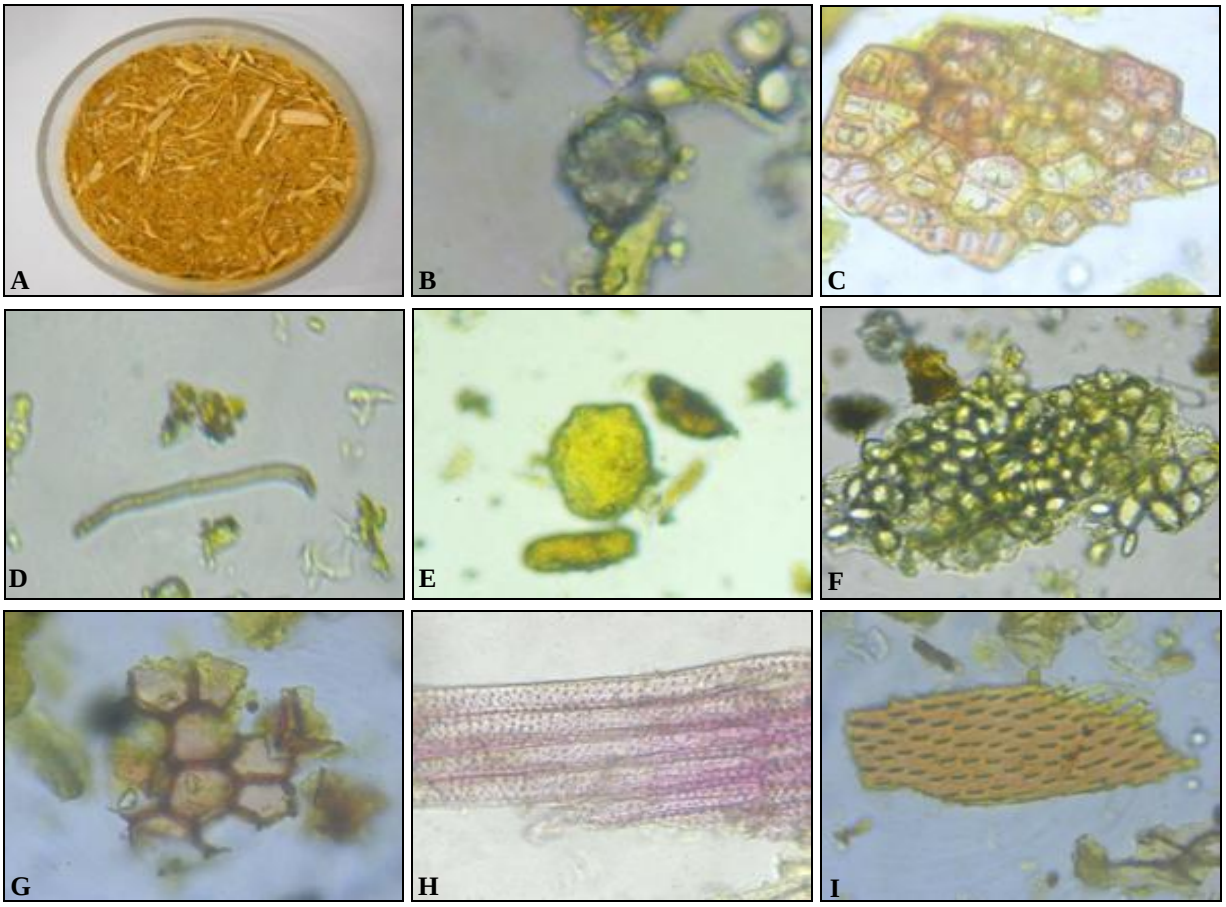

FIG. 2: A) POWDER OF GROUP - 1, B) LIGNIFIED COLLENCHYMA CELLS OF GUDUCHI, C) ROSETTE CRYSTAL OF MESHSHRINGI *(DAEMIA EXTENSA)*, D) SIMPLE FIBER OF SARIVA, E) PARANCHYMA CELLS OF HARIDRA, F) PARANCHYMA CELLS OF HARIDRA, G) LIGNIFIED CORK IN SURFACE VIEW OF MESHSHRINGI *(DAEMIA EXTENSA)*, H) GROUP OF LIGNIFIED PITTED FIBERS OF MESHSHRINGI (*DAEMIA EXTENSA*), I) LIGNIFIED BORDER PITTED VESSEL OF SARIVA

Physicochemical Parameters: Samples of both the compositions were subjected to physico-chemical parameters like a loss on drying, total ash, acid insoluble ash, water-soluble extractive value, alcohol soluble extractive value, pH value, *etc*. by trial and error method (by taking successive readings). The mean value is taken into consideration. Results are depicted in **Table 2**.

TABLE 2: PHYSICOCHEMICAL PARAMETERS OF COMPOSITIONS

S. no.	Parameters	Classical Group (Mean ± SEM)	Group – 1 (Mean ± SEM)
1	L.O.D. (% w/w)	0.17 ± 0.01	0.10 ± 0.04
2	Total ash (% w/w)	1.87 ± 0.02	1.77 ± 0.02
3	Acid insoluble ash (% w/w)	0.17 ± 0.03	0.03 ± 0.01
4	Alcohol soluble extract (% w/w)	0.18 ± 0.01	0.21 ± 0.03
5	Water soluble extract (% w/w)	0.20 ± 0.01	0.20 ± 0.01
6	pH (at room temp.) (Aqueous 5%)	5.76	5.72

"L.O.D. = Loss on Drying."

Preliminary Qualitative Tests: Samples of both compositions were qualitatively tested for the presence of different phytoconstituents. Saponin glycoside, alkaloid, and tannin are present in both the extracts. The other observed results in methanolic extracts are shown in **Table 3**.

TABLE 3: QUALITATIVE CHEMICAL SCREENING OF COMPOSITIONS

S. no.	Phyto-constituents	Tests	Classical Group	Group - 1
1	Carbohydrates	Molish's	-	-
2	Reducing Sugar	Fehling's	-	-
3	Proteins	Biuret	-	-
4	Tannins	$FeCl_3$	+	+
5	Steroids	Salkowski	-	-

6	Alkaloids	Dragendroff's	+	+
7	Flavanoid glycoside	Lead acetate	-	-
8	Saponin glycoside	Foam	+	+
9	Amino acids	Ninhydrin	-	-

'+'Present, '-' Absent

DISCUSSION: For the first time work had been carried out regarding *Valli panchmoola* or its compositions by replacing the source or one of their species. In the present study detail, a comparative study of different compositions of *Valli panchmoola* has been undertaken. The research work was conducted to ensure the two different compositions by using different species of Meshshringi. *Daemia extensa* used over source *Gymnema sylvestre* due to non - availability of the source of meshshringi in the group of drugs *Valli panchmoola* [14].

In this study, there were two groups, *i.e*., classical group and Group-1 which were made by replacing the varieties of meshshringi. According to the pharmacognostical point of view, organoleptic characters and microscopical characters were almost similar in both the groups. Only a few microscopical characters were different like; laticiferous cell, fibers passing through medullary rays, *etc*. pharmacological activity shows almost similar activities, *i.e*. anti-diabetic, anti-inflammatory, *etc*. according to research work done before on individual drugs [15, 16].

In the phytochemical analysis, both groups showed all values almost similar, whereas acid insoluble ash observed more in the classical group as compared to group-1.

CONCLUSION: The values obtained from pharmacognostical and analytical studies, including physicochemical parameters and qualitative analysis can be used for standardization of identity and purity amongst different compositions of *Valli panchmoola*. The standard results may help with further research works.

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CONFLICT OF INTEREST: Declared none

REFERENCES:

1. Ayoub Z, Mehta A and Mishra SK: Ethnopharmacological review of natural products in cancer prevention and therapy, AJPCR.
2. Shankar D and Ved DK: Ind Forester 2003; 129: 275-288.
3. Ayoub Z and Mehta A: Medicinal plants as a potential source of antioxidant agents: a review. AJPCR.
4. World Health Organization Geneva, Quality control methods for medicinal plant materials, Type set in Hong Kong, Printed in England, ISBN 92 415 45100 (NLM classification QV 766).
5. Dahanurkar SA, Kulkarni RA and Rege NN: Ind J Pharmacol 2002; 32: 81-118.
6. Thomas S, Patil DA, Patil AG and Chandra N: Pharmacognostic evaluation and physicochemical analysis of *A. carambola* L. fruit. J of Herb Med & Toxicol 2008; 51-54.
7. Khandelwal KR: Practical Pharmacognosy. Nirali Prakashan, Pune, Edition 19th, 2008: 9-19.
8. Lohar DR: Protocol for testing, Ayurvedic, Siddha, Unani medicines, the government of India. Appendix-2. Ghaziabad: Department of AYUSH, Ministry of Health & Family Welfare, Pharmacopoeial Laboratory for Indian Medicines 2007; 41-44.
9. Anonymous: The Ayurvedic Pharmacopoeia of IndiaNew Delhi: Government of India, Ministry of Health and Family Welfare, Department of AYUSH, Edition 1st, Vol. II, Part-II, 2008: 159-161.
10. Wallis TE: Textbook of Pharmacognosy. CBS Publishers & Distributor, New Delhi Ed 5th, 2002: 123-132, 210-215.
11. Anonymous: Ayurvedic Pharmacopoeia of India. DISM & H, Edition 1st, Vol. 1, Part-1, Reprinted 2001: 143.
12. Kokate CK, Purohit AP and Gokhale SB: Pharmacognosy. Nirali Prakashan, Pune, Edition 2nd, 2008: 6.13, 6.17, 6.42.
13. Budiman A, Khoerunnisa R and Qoriah TA: Wound-healing test of *Piper betle* leaf extract and *Aloe vera* in gel preparation, IJAP.
14. Sastry JLN: Dravyaguna vijnana. Chaukhambha orientalia, Varanasi, Reprint Vol. 1, 2009: 274.
15. Wahi AK, Ravi J, Hemalatha S and Singh PN: Anti-diabetic activity of *Daemia extensa* R. Br. JNR, https//doi.org/10.18311/jnr/2002/350.
16. Gholap S and Kar A: Effects of *Inula racemosa* root and *Gymnema sylvestre* leaf extracts in the regulation of corticosteroid-induced diabetes mellitus: involvement of thyroid hormones AIJPS.

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