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Research Article

ANALYTICAL STUDY OF *PIPPALYADIGANA VATI* - AN AYURVEDIC FORMULATION

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ABSTRACT

In Ayurveda, the raw drugs are classified under various groups known as *Gana,* which contain substances with comparable qualities that can treat a particular ailment. *Ganas* are very crucial to making the treatment field simpler and more efficient. *Acharya Sushrut* made a truly remarkable contribution by classifying the drugs into 37 distinct categories for various ailments. *Pippalyadi gana* is one of the *Ganas* described by *Acharya Sushruta* and is specially mentioned for the management of *Pratishyaya*. *Pratishyaya* is one important disease of *Urdhwajatrugata Roga*. In Ayurveda*, Kalka, Kawath, Churna* and *Vati* are the most frequently used form of medication. *Vati* preparation is considered a secondary *Kashaya Kalpana* and offers an easy way to administer oral medication*.* In the present study, 14 drugs from *Pippalyadi Gana* were selected for *Vati* preparation and certain of them were used in *Kwath* form for *Bhavna*, while the drugs containing volatile oils were utilized in powder form. *Vati Kalpana* has been prepared according to general method of preparation *Vati* mentioned in API. Prepared *Vati* were tested by many parameters including physical and chemical ones, such as weight variation and disintegration time, and chromatographic tests, such as TLC fingerprinting, were used to standardize it. After the testing, all parameters were found to be within API standard limits. This kind of result indicates a good therapeutic property of *Vati Kalpana* which can be used as oral medication for *Pratishyaya*.

INTRODUCTION

Ayurveda is a credible comprehensive system, and consists of various Ayurvedic formulations founded by plants and minerals. *Vati, Gutika*, which is known as a tablet or pill, is one among various secondary preparations. *Vati Kalpana* has its own specific qualities, like easy to swallow, long shelf life, easy fix of dosage, masking the bitter taste, irritating odor and an attractive. Apart from various preparations, *Acharyas*, stated numerous drugs in the same festoon, *Acharya Sushruta* classifies 37 *Ganas*[2] of drugs according to their specific properties besides that instructed to physician to use them in various forms according to convenience and need disease[3]. *Pippalyadigana* was specified by *Acharya* for the management of *Pratishyaya, Vatavikar* and *Aruchi.*[4]

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All the *Acharya* explains *Pratishyaya* under *Nasagata Roga.* A wide classification of *Pratishyaya* is available on the basis of stage of disease. Along with a wide description of the line of treatment for disease, *Acharya* also stated that physicians can choose a suitable drug or a combination on the basis of the different conditions of patients.

Acharya Sushrut includes 22 drugs in *Pippalyadigana* and 14 drugs of *Gana* which were accessible and incontestable were selected for *Vati* preparation. Among these drugs, 9 have volatile oils, because of this, used in powder form and the rest were used as a *Kwath* to potentiate the powdered drugs with 3 *Bhavna*. All the content is mentioned in [Table 1 & Table 2]. Then potentiated formulation was made into tablets of 250mg. Because of this yoga, ingredients, *Deepan Pachana* property pacifies *Vata-Kapha doshas*, helps to counteract the symptoms of *Pratishyaya* which also a *Vata-Kapha* predominant *Vyadhi*.

MATERIALS AND METHODS

Collection of Raw Materials

All raw drugs which are used for *Vati* preparation (shown in figure 1-14) were taken from Hansa Pharmacy, Premnagar Ashram Sidkul, Haridwar Uttarakhand and final product i.e., *Pippalyadigana Vati* was prepared in the Hansa Pharmacy Sidkul, Haridwar Uttarakhand. The ingredients were identified by PG Department of Dravyaguna, Rishikul Campus Haridwar.

Preparation of *Pippalyadigana Vati* (Fig. 15-25)

All the *Churna Dravyas* were taken in equal amount i.e. 220gm each in dry form. After that all drugs mixed and made into fine homogenous powder methodically. All the *Kwath Dravyas* were taken in equal amount i.e., 800gm each in dry form. *Kwatha Dravyas* were consumed in excess to boost the potency of *Vati*. Then all dried *Kwath Dravya* mixed and made into coarse homogeneous mixture and used to prepare *Kwath.* The coarse powder of *Kwath Dravya* was soaked in water for a night. *Kwath Dravya* pouring in 8 times of water and heating were start on mild flame with stirring, till water was rest one fourth then heating was stopped and *Kwath* was filtered through a muslin cloth. After cooling of *Kwath*, 3 *Bhavna* with *Kwath* in fine powder of *Churna Dravya* was given and *Bhavit* formulation dried in a drier and granulation done then required amount of *Gonda* was mix in it for tablet formation. When the formulation dried completely, tablet of 250mg were formed with tablet forming machine and tablets were packed in aseptic condition.

Analytical Study

Prepared final product i.e., *Pippalyadigana Vati* was analyzed by employing various analytical parameters.

Organoleptic Study

Organoleptic characteristics like description, colour, odor, disintegration time, etc of *Pippalyadigana Vati* were observed. [Table-3]

TLC Profile

Instrument used was Silica plate. The stationary phase used was TLC plate silica gel F254 and mobile phase was Toluene: Ethyl acetate (90:10). The plate was sprayed with vanillinsulphuric acid reagent and the spots were detected after heating at 105°C for 10 min. RF value of each spot was recorded shown in Fig-26.

Heavy Metal Analysis

Heavy metal analysis reveals lead, cadmium, arsenic, mercury mentioned. [Table- 5]

Microbiological Limit Test

Microbial load estimation shows total bacterial count and total yeast and mould count. Test for other specific pathogen is negative. [Table- 6]

RESULT

Composition of *Pippalyadigana Vati*

Table 1: *Kwath dravya*

S.No	*Dravya*	Latin Name	Family	Used Part	Ratio
1.	*Harenuka*	*Vitex negundo*	Verbenaceae	Seed	1 part (800gm)
2.	*Vidanga*	*Embelia ribes*	Myrsinaceae	Fruit	1 part (800gm)
3.	*Sarshapa*	*Brassica compestris*	Cruciferae	Seed	1 part (800gm)
4.	*Kutaki*	*Picrorhiza kurroa*	Scrophulariaceae	Root	1 part (800gm)
5.	*Indrayava*	*Holarrhena Antidysenterica*	Apocynaceae	Seed	1 part (800gm)

Table 2: *Churnadravya*

S.No	*Dravya*	Latin Name	Family	Used part	Ratio
1.	*Pippali*	*Piper longum*	Piparaceae	Fruit	1 part (220gm)
2.	*Pippalimool*	*Piper longum*	Piparaceae	Root	1 part (220gm)
3.	*Chitraka*	*Plumbago zeylanica*	Plumbaginaceae	Root	1 part (220gm)
4.	*Shunthi*	*Zingiber officinale*	Zingiberaceae	Rhizome	1 part (220gm)
5.	*Maricha*	*Piper nigrum*	Piperaceae	Fruit	1 part (220gm)
6.	*Ela*	*Elettaria cardamomum*	Zingiberaceae	Seed	1 part (220gm)
7	*Aajmoda*	*Apium graveolens*	Umbelliferae	Fruit	1 part (220gm)
8.	*Jeera*	*Cuminum cyminum*	Umbelliferae	Fruit	1 part (220gm)
9.	*Vacha*	*Acorus calamus*	Araceae	Root	1 part (220gm)

Table 3: Organoleptic Parameters of *Pippalyadigana Vati*[5]

S.No.	Test	Result
1.	Color	Brown
2.	Appearance	Round shaped tablet
3.	Odour	Characteristic
4.	Disintegration time	10-11 minutes
5.	Weight variation (%)	-3.11 to +1.17

Table 4: Pharmacodynamics of contents *Pippalyadigana Vati*[6]

Drug	*Rasa*	*Guna*	*Veerya*	*Vipak*	*Dosh Shamak*
Pippali	*Katu*	*Laghu, Tikshana, Snigdha*	*Anushna-sheet*	*Madhur*	*Vatakapka*
Pippalimool	*Katu*	*Laghu, Ruksha*	*Ushna*	*Katu*	*Vatakapka*
Chitraka	*Katu*	*Laghu, Ruksha, Tikshan*	*Ushna*	*Katu*	*Vatakapka*
Shunthi	*Katu*	*Laghu, Snigdha*	*Ushna*	*Madhur*	*Vatakapka*
Harenuka	*Katu, Tikta*	*Laghu, Ruksha*	*Ushna*	*Katu*	*Vatakapka*
Sarshapa	*Katu, Tikta*	*Tikshan, Ushna*	*Ushna*	*Katu*	*Vatakapka*
Vidanga	*Katu, Kashaya*	*Laghu, Ruksha, Tikshan*	*Ushna*	*Katu*	*Vatakapka*
Kutaki	*Tikta*	*Ruksha, Laghu*	*Sheet*	*Katu*	*Pittakapha*
Maricha	*Katu*	*Laghu, Tikshana*	*Ushna*	*Katu*	*Vatakapka*
Ela	*Katu, Madhur*	*Laghu, Ruksha*	*Sheet*	*Madhur*	*Tridosha*
Aajmoda	*Katu, Tikta*	*Laghu, Ruksh,Tikshan*	*Ushna*	*Katu*	*Vatakapka*
Indrayava	*Katu*	*Laghu, Ruksh*	*Sheet*	*Katu*	*Tridosha*
Jeera	*Katu*	*Laghu, Ruksha*	*Ushna*	*Katu*	*Vatakapka*
Vacha	*Katu, Tikta*	*Laghu, Tikshana*	*Ushna*	*Katu*	*Vatakapka*

Herbal Contents of *Pippalyadigana Vati*

Fig. 1. *Piper longum* (*Pippali*)

Fig. 2. *Piper longum* (*Pippalimool*)

Fig. 3. *Plumbago* (*Chitraka*) *zeylanica*

Fig. 4. *Zingiber officinale* (*Shunthi*)

Fig. 5. *Vitex negundo* (*Harenuka*)

Fig. 6. *Brassica campestris* (*Sarshapa*)

Fig. 7. *Embelia ribes* (*Vidanga*)

Fig. 8. *Picrorhiza kurroa* (*Kutaki)*

Fig. 9. *Piper nigrum* (*Marich*)

Fig. 10. *Elettaria cardamomum* (*Ela*)

Fig. 11. *Apium graveolens* (*Aajmoda*)

Fig. 12. *Holarrhena antidysenterica*

Fig. 13. *Cuminum cyminum* (*Jeera*)

Fig. 14. *Acorus calamus* (*Vacha*)

Preparation of *Pippalyadigana Vati*

Fig. 15. Grinding of drugs

Fig. 16. Fine power

Fig. 17. Coarse Powder for *Kwath*

Fig. 18. *Kwath* preparation

Fig. 19. *Bhavna*

Fig. 20. Preparation for drying

Fig. 21. Material after drying

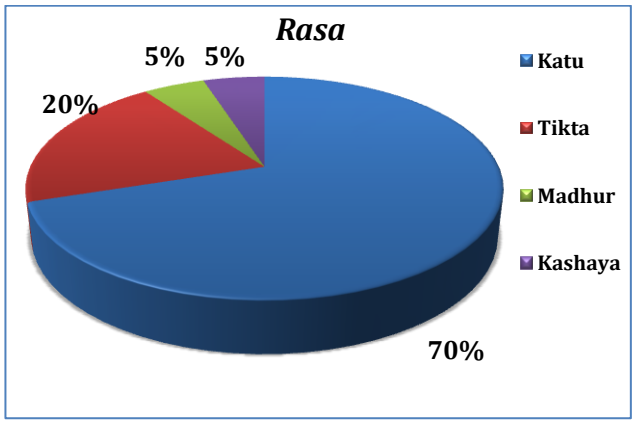
Fig. 22. Mixing of *Gonda*

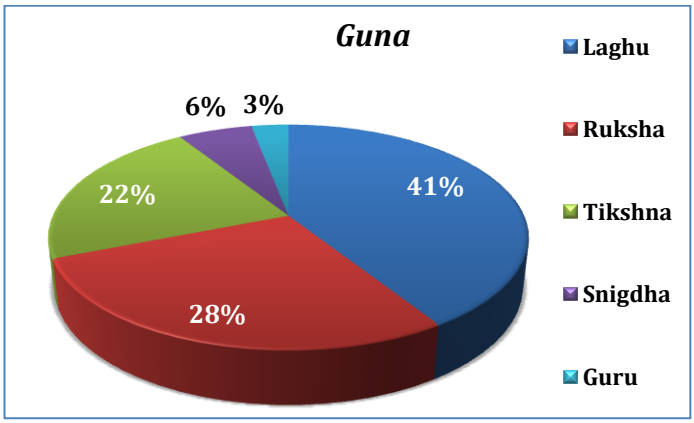
Fig. 23. Prepared Tablets

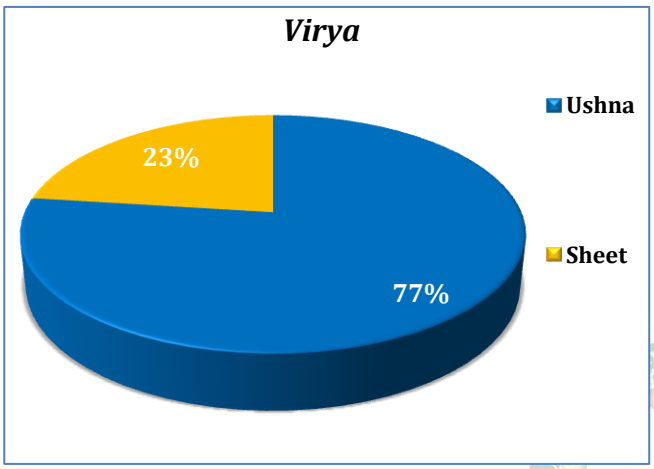
Fig. 24. Packed Tablet

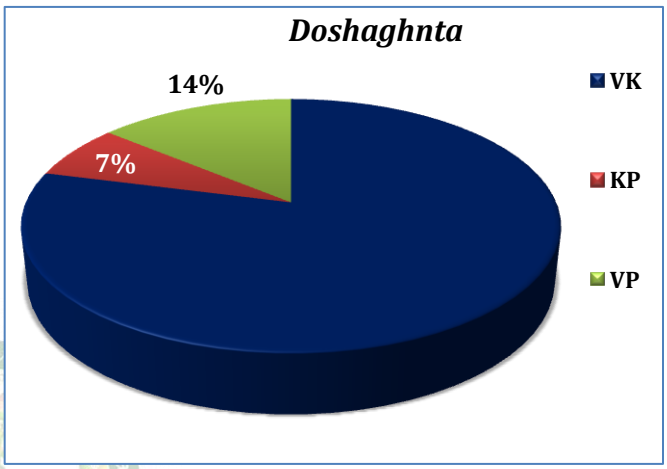
Fig. 25. Packed Tablet

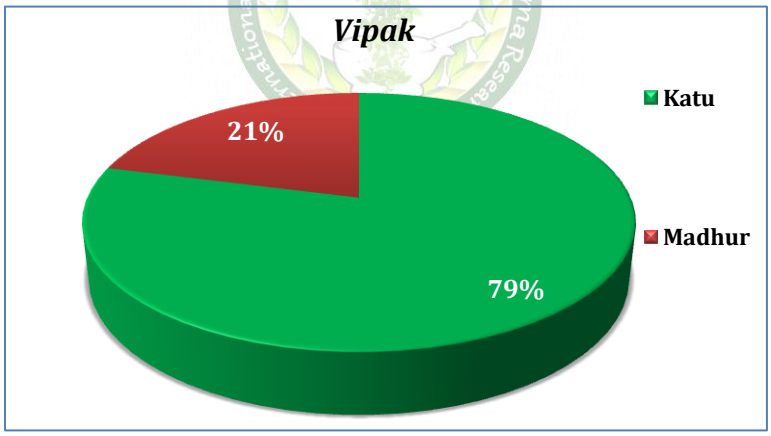
Graphical presentation of Pharmacodynamics of contents of *Vati*











Thin Layer Chromatography (TLC)

Thin Layer Chromatography (TLC) was carried out. It showed RF values 0.874, 0.804, 0.784, 0.701, 0.644, 0.506, and 0.356 which may be responsible for expression of its pharmacological and clinical actions. [Fig-24]

Table 5: Heavy Metals

S.No.	Heavy Metals	Result
1.	Lead (pb) ppm	2.82
2.	Arsenic (As) ppm	0.04
3.	Cadmium (Cd) ppm	0.56
4.	Mercury (Hg) ppm	0.28

Table 6: Microbial Load estimation of formulated *Vati*

S.No.	Test	Result
1.	Total bacterial count	12000 (cfu/g)
2.	Yeast and mould count	200 (cfu/g)
3.	*E. coli*	Absent
4.	*S. aureus*	Absent
5.	*P. aeruginosa*	Absent
6.	*Salmonella sp.*	Absent

DISCUSSION

In the medical texts of Ayurveda, *Acharya Charaka*[7] and *Sushruta*[8] classify the medicinal plants into groups of drugs as per their therapeutic indication and therapeutic use, respectively. With the help of proper *Yukti* physicians can transform natural drugs into easily administrable preparation. *Acharya Vagbhatta* mentioned that groups of drugs can be used in various forms according to the *Doshas* and *Dushya*[9]. *Vati Kalpana* is the consequence of *Kalka Kalpana* among the five cardinal preparation of Ayurveda pharmaceutical science. The *Vati* was made into pharmacy under essential maintained highest level of hygiene from the beginning of the manufacturing and packaging of final product to maintain lowest possible level of pathogenic organism. The content of *Pippalyadigana Vati* has predominance of *Katu* (70%) *Tikata* (20%) *Rasa, Laghu* (41%) *Ruksha* (28%) *Tikshna* (22%) *Gunas, Ushna Virya* (77%), and *Katu Vipaka* (79%). Hence it acts as *Vatakaphashamaka* (79%) [Table-4], drugs also have *Deepana-Pachana, Shoolaghna* properties, which make it effective for the management of *Vataja Pratishyaya*. Disintegration time, weight variation, identification (by TLC), microbial limits, heavy metals all are found in normal limits, which indicate good quality of product.

RESULT AND CONCLUSION

The *Pippalyadigana Vati* is an Ayurvedic formulation, prepared by the drugs of *Pippalyadigana* and standardization was performed for organoleptic properties, physicochemical properties as per standard parameters. The standard parameters were observed and the results showed that formulation i.e., *Pippalyadigana Vati* is palatable to the patients.

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