Pharmaceutical and Anaiytical study of *kantakary avaleha*

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ABSTRACT

The ancient Indian medical system known as *Ayurveda* places a strong emphasis on a range of dose forms, of which *Avaleha Kalpana* is particularly noteworthy because of its therapeutic efficacy, stability, and palat ability.Often used to treat respiratory ailments like *Shwasa* (asthma) and *Kasa* (cough), *Kantakary avaleha* is a traditional polyherbal preparation that is referenced in eputable *Ayurvedic* books *Ayurveda*, the ancient system of medicine, emphasizes various dosage forms to enhance therapeutic efficacy, stability, and palatability. Among these, *Avaleha Kalpana* holds a significant place due to its wide applicability, longer shelf life, and patient acceptability. This dosage form, prepared with herbal decoctions, powders, sweetening agents, and adjuvants, is traditionally prescribed in several disorders, particularly of the respiratory system.

Aim:The present work aims to conduct a comprehensive pharmacological and analytical study of *Kantakary avaleha* with special focus on *Avaleha Kalpana*, so as to ensure its standardization, quality control and reproducibility.

Materials and Methods:The study involves detailed documentation of the pharmaceutical preparation steps of *Kantakary avaleha*, including *Kwathapaka*, addition of *Prakshepadravya*, and *Madhyama paka lakshana*. Analytical parameters such as organoleptic characters, pH, specific gravity, total solid content, moisture content, sugar estimation, and qualitative phytochemical analysis are evaluated to establish standard profiles.

Results:Pharmaceutical observations highlighted the significance of sequential processing and the critical role of *paka lakshanas* in achieving proper *Avaleha* consistency. Analytical findings provided reproducible parameters, including uniform pH, specific gravity, and stable organoleptic characteristics, thereby supporting the standardization of *Kantakary avaleha*.

Conclusion:The pharmaceutical and analytical study of*Kantakary avaleha* confirms its conformity to *Avaleha Kalpana* principles and validates its quality standards. This contributes to ensuring safety, efficacy, and reproducibility, thus promoting wider clinical utility of this traditional formulation.

Keywords:*Kantakary avaleha, Avaleha Kalpana, Ayurveda*, Pharmaceutical Study, Analytical Study, Standardization, *Paka Lakshana*.

INTRODUCTION

Ayurveda, the ancient system of medicine, emphasizes various dosage forms to enhance therapeutic efficacy, stability, and palatability. Among these, *AvalehaKalpana*[1] holds a significant place due to its wide applicability, longer shelf life, and patient acceptability. This dosage form, prepared with herbal decoctions, powders, sweetening agents, and adjuvants, is traditionally prescribed in several disorders, particularly of the respiratory system.

Kantakaryavaleha[2], a well-documented polyherbal formulation, is mentioned in classical *Ayurvedic* texts as an effective remedy for conditions like *Shwasa* (asthma) and *Kasa*[3] (cough). The combination of herbs in this formulation is believed to provide synergistic action in relieving respiratory distress, improving immunity, and balancing doshas.With growing interest in standardization and scientific validation of *Ayurvedic* medicines, it becomes essential to undertake pharmaceutical and analytical studies. Such studies not only ensure the authenticity and quality of formulations but also establish parameters for reproducibility and therapeutic reliability. Hence, the present research focuses on the pharmaceutical preparation and analytical evaluation of *Kantakary avaleha* with special reference to *Avaleha Kalpana*.

Aims and Objectives: To comprehensive pharmacological and analytical study of *Kantakary avaleha* with special focus on *Avaleha Kalpana*, so as to ensure its standardization, quality control and reproducibility.

Materials and methods:

Collection of raw drugs:
All the raw drugs were purchased from HHRC (Herbal Health Research Consortium Limited) Amritsar. All the Herbal drugs were analysed in laboratory of HHRC Amritsar. *Sita*(Sugar Candy) was purchased from local market of patiala. *Madhu (*Bee honey) was purchased from the amolak outlet Patiala panjab .

Pharmaceutical Procedure

Kantakari Avaleha was prepared at Practical lab of *Rasashastra* and *Bhaishajya Kalpana*, Govt. Ayurvedic College and Hospital Patiala, Punjab. The pharmaceutical procedure was carried out as mentioned below:

Study Protocol
A. Preparation of *KantakariAvaleha* Classical method
The whole process was carried out in following steps as mention below
1. Preparation of *Kwatha Choorna*
2. Preparation of *Kwatha*r
3. Preparation of *Pippali Choorna*
4. Preparation of *Kantakari Avaleha*

Preparation of *Churna* (powder)*[4]*
• *Guduchi, Chavya, Chitraka, Musta, Karkatashringi, Shunthi, Maricha,Pippali,Dhanvayasaka, Rasna, Shati, Tugaksiri (Vamshalochana)* are the raw materials should be used as fine powder in this formulations. Each raw material was separately taken and removed physical impurities and dried under sunlight. They were Grinded by using Mini Pulverizer and sieved through# 72.The powder which not passing through #72 it was again grinded using Mixture grinder and sieved again through #72.Packed each powder separately in airtight polyethylene containers. Results of the *Prakshepa*is mentioned in table 1.

Preparation of *Kantakari Kwatha* (decoction)

Kantakari Panchanga was taken, and removed physical impurities, washed with potable water and then cut with cutter and crushed by using wet grinder. 1 tula(4.8 kg) Crushed *Kantakari Panchanga* was taken in a stainless steel vessel. Then 1 droan (12288ml)water was added it and subjecting toheating process and reduced water into 1/4 th(quarter)of its initial volume. Then filtered through aclean cotton cloth to obtain *Kwata.* Results is mentioned in table 2.

Preparation of *Kantakari Avaleha*[5,6]

The specific classical method mentioned for *Kantakari Avaleha* in *Bhaishajya Ratnavali*[7] was followed for the preparation of *Kantakari Avaleha*. According to that; added *Sita20 pala (960 gm*sugarcandy) in *Kantakari Kwatha* and stirred over heating until dissolve the sugar well for 10minutes. Temperature of the homogenous mixture was around 90^{0}C.Then the mixture of sugar and *Kwatha* was filtered through double cloth to remove physical impurities of sugarcandy. Add the powdered ingredients named as *Churna ,Dravya, Guduchi,Chavya, Chitraka, Nagarmotha, Kakadasingi, Dry Ginger, Black Pepper, Pippali , Jawasa, Bharngi, Rasna and Shati*each 1 pala (48 gm) (Sr.no.2-13 in Table 3) with 8 pala *Ghrita* and 8 pala *Taila* to the filtrate. Heating process was carried out at between 80- 85^{0}C temperature with stirring, till it attains the consistency of *Leha* confirmed by the formation ofsoft bolus, which does not disperse in water. Then stop heating process and allow for selfcoolingup to around 60^{0}C temperature. After that added fine powders of *Vamsalochana ,Pippali* and stirred properly till uniform mixing and allow them for cool in room temperature.*Madhu* was added at 30^{0}C temperature and mix thoroughly to obtain homogeneous blend.Final product was store in airtight containers.

Observations and Results

During preparation of *Churna Dravya* (Sr.no.2-13 in Table 2), maximum (13.5%) and minimum (3.2%) loss was observed in *Musta* and *Rasna* respectively. The more loss in *Musta* may be due to more content of fibrous material. During *Prakshepa dravya churna* preparation, 4.7 % & 8 % loss was noted in *Vamshalochana* and *Pippali*(Table 2). Method of Preparation of *Kantakari Kwatha* was same for all the batchers. *Kantakari Panchanga* was used for the preparation of *Kwatha*[8]in the ratio of drugs & water 1: 2.56. After reduced to 1/4th, colour of the *Kwatha* was changed from greenish colour to dark brown colour with characteristic odor of *Kantakari* and its taste was *Tikta* and *Kashaya Rasa*. In KA, after addition of *Churna Dravya* with *Ghrita* and *Taila* to the filtrate temperature was noted 80- 85^{0}C. During *paka, Tantumatva Lakshana* was not found in this process, but *Darvi Pralepatva, Apsumajjati* with *Sthiratwa Lakshana* was observed. *Piditha mudra, Gandha, Varna, Raso dbhava* were observed in final product. Colour of the final product of KA was blackish brown colour, semisolid to solid paste with bitter, sweet and astringent taste. In final stage of *Kantakari Avaleha*, oil was observed in outer surface.

Discussion

Condition of *Kantakari* (whether raw or fresh) to be used for *Kantakari Kwatha* was not in specified in the text. Considering ratio of *Kantakari* to water id est. 1: 2.56; it was decided to use *Kantakari*. Special attention should be given to not contaminate the *Kwatha* with its thorny parts.While preparing KA, Temperature must be maintain throughout the process for preventing the sticking constituent over bottom of the vessel. Heating process should be continue until moisture evaporated and till oil layer start separating .

All the physico-chemical parameters were compared with physicochemical parameters of plant origin ingredients of formulation mentioned in API. Range of API values of total ash is not more than 7.0 per cent, range of Alcohol-soluble extractive of ingredients are mentioned to be not less than 25.0 percent and Water soluble extractive should not be less than 37.0 percent. All the values as per the limits (Ash value) and minimum valuesof extractives mentioned in API. pH shows that the aqueous solution of the samples were mild acidic in nature i.e. between 6 and 5.5. This acidic pH complies with absorption of maximum formulation ingredients in view of significant water soluble extractive from oral cavity and stomach i.e. both in the presence of acidic environment and chances of change of nature of drug due to alteration in pH shall be nullified. Total of Sugar content (%) of KA 32.0%, Reducing sugar (mg) was 12.5%,and Non-reducing sugar (mg) 19.5 % respectively.

The results of pH and all the sugar content parameters (Total, Reducing & Non-reducing sugar content) of both the samples were within the limit same as API.

TLC fingerprint profile of Kantakari Avaleha (KA) under UV light at 254 nm and 366 nm. Eight distinct spots were observed at 254 nm indicating the presence of multiple phytoconstituents (alkaloids, glycosides, phenolics). At 366 nm, five fluorescent bands were observed confirming the presence of flavonoids, coumarins, and saponins. The fingerprint demonstrates the polyherbal identity and can be used for quality control and standardization of KA mentioned in the API.(Fig.1)

Conclusion

Converting *Avaleha* help in fixing the dose, easy to administer, and also increases the shelf life. The results obtained from KA are within the standard data mentioned in API.Conclusion:

The pharmaceutical preparation of *Kantakari Avaleha* was successfully standardized through detailed observation of raw drug processing, *Kwatha* preparation, and *Avaleha* formulation. The percentage loss during *Churna Dravya* preparation varied depending on fibrous content of individual drugs, with *Musta* showing maximum loss. The prepared *Kantakari Kwatha* exhibited the expected organoleptic characteristics, and *Avaleha* formation showed classical *lakshanas* such as *Darvi Pralepatva, Apsumajjati*, and *Sthiratva*. The final *Avaleha* was blackish-brown, semisolid to solid, with characteristic taste and oil separation, indicating proper *paka*.

Physicochemical analysis revealed that all batches complied with the API standards for ash value, alcohol-soluble and water-soluble extractives. The pH of all samples was mildly acidic (5.5–6.0), supporting better solubility and absorption in the gastrointestinal tract. Thus, the prepared *Kantakari Avaleha* was found pharmaceutically stable, organo leptically acceptable, and within the prescribed quality standards, ensuring its therapeutic reliability.

List of Table

Table 1: Composition of *Kantakari Avaleha*

S.N.	Name	Botanical name	Family	Partused	Proportion
1	*Kantakari*	*Solanumsuratense*	Solanaceae	Panchang	100pala(4.8 kg)
2	*Guduchi*	*Tinosporacardifolia*	Menispermaceae	Kand	4tola(48 gm)
3	*Chavya*	*Piper officinarum*	Piperaceac	MoolFruit	4tola(48 gm)
4	*Chitraka*	*Plumbagozeylanica*	Plumbaginaceae	Mooltvak	4tola(48 gm)
5	*Musta*	*Cyperusrotundus*	Cyperaceae	Kand	4tola(48 gm)

6	*Karkathringi*	*Pistaciainteg errima*	Anacardiaceae	Shrngaakaarrkosh	4tola(48 gm)
7	*Sunthi*	*ZingiberOfficinale*	Zingiberaceae	Kand	4tola(48

8	*Marich*	*Piper Nigrum*	Piperaceae	Fruit	4tola (48 gm)
9	*Pippali*	*PiperLongum*	Piperaceae	Fruit,mool	4tola(48 gm)
10	*Bharangi*	*Clerodendrumserratum*	Verbenaceae	Mool	4tola(48 gm)
11	*Dhanvyasa*	*Fogonia cretica*	Zygophyllaceae	Panchang	4tola(48 gm)
12	*Rasna*	*Pluchealanceolata*	Compositae	Leaf	4tola(48 gm)
13	*Kachur*	*Curcuma zedoaria*	Zingiberaceae	Kand	4tola(48 gm)
14	*Vanshlochan*	*Bambusaarundinacea*	Graminae	Mool,leaf,fruit	16tola(192 gm)
15	*Pippali*	*PiperLongum*	Piperaceae	Fruit,mool	16tola(192 gm)
16	Sugar	Sugar Candy			20pal(960 gm)
17	*Ghrita*	Ghee			8pal(384 ml.)
18	Oil (*TailaTila)*	*Sesame oil*			8pal(384 ml.)
19	Honey	Bee honey			8pal(384 ml.)

Table2: Detailsof results of *Prakshepa Dravya churna*

S.N	Ingredients	Qty. of initial raw material	Qty. offinepowder after passed through#72	Qty. of materials not passed through 72#	Total loss (%)	Total yield (%)
1	*Guduchi*	48 g	45.385g	2.616g	5.45	94.54
2	*Chavya*	48 g	45.820 g	2.179g	4.54	95.45
3	*Chitraka*	48 g	46.036g	1.963g	4.09	95.91
4	*Musta*	48 g	41.52 g	6.48 g	13.5	86.5
5	*Karkatashringi*	48 g	45.6g	2.4g	5.8	94.20
6	*Shunthi*	48 g	42.384g	5.616g	11.7	88.3
7	*Maricha*	48 g	45.6 g	2.4 g	5.0	95
8	*Pippali*	48g	44.16g	3.84 g	8.0	92.0
9	*Dhanvayasaka*	48 g	43.2g	4.8g	10.0	90.0
10	*Bharangi*	48 g	46.032g	1.968g	4.0	96
11	*Rasna*	48 g	46.464g	1.536g	3.2	96.8
12	*Kchur*	48g	45.6g	2.4 g	5.0	95.0
13	*Tugaksiri*	196 g	186.788g	9.212g	4.7	95.30

Table3:Results of Kantakari Kwatha

Sl. No.	Ingredient	Quantity of ingredient	Quantity of Water
01.	*KantakariPanchanga*	1 tula (4.8 kg)	1 droan (12288ml)

Table4:Ingredients and their quantity of *Kantakari Avaleha;*

S.N.	Name	Botanical name	Family	Partused	Proportion
1	*Kantakari*	*Solanumsura ttense*	Solanaceae	Panchang	100pala(4.8 kg)
2	*Guduchi*	*Tinosporacar difolia*	Menispermaceae	Kand	4tola(48 gm)
3	*Chavya*	*Piper officinarum*	Piperaceac	MoolFruit	4tola(48 gm)
4	*Chitraka*	*Plumbagozey lanica*	Plumbaginaceae	Mooltvak	4tola(48 gm)
5	*Musta*	*Cyperusrotu ndus*	Cyperaceae	Kand	4tola(48 gm)

6	*Karkathringi*	*Pistaciainteg errima*	Anacardiaceae	Shrngaakaarrko sh	4tola(48 gm)
7	*Sunthi*	*ZingiberOffic inale*	Zingiberaceae	Kand	4tola(48 gm)
8	*Marich*	*Piper Nigrum*	Piperaceae	Fruit	4tola(48 gm)
9	*Pippali*	*PiperLongum*	Piperaceae	Fruit,mool	4tola(48 gm)
10	*Bharangi*	*Clerodendru mserratum*	Verbenaceae	Mool	4tola(48 gm)
11	*Dhanvyasa*	*Fogonia cretica*	Zygophyllaceae	Panchang	4tola(48 gm)
12	*Rasna*	*Pluchealance olata*	Compositae	Leaf	4tola(48 gm)
13	*Kachur*	*Curcuma zedoaria*	Zingiberaceae	Kand	4tola(48 gm)
14	*Vanshlochan*	*Bambusaarun dinacea*	Graminae	Mool,leaf,fruit	16tola(192 gm)
15	*Pippali*	*PiperLongum*	Piperaceae	Fruit,mool	16tola(192 gm)
16	Sugar	Sugar Candy			20pal(960 gm)
17	*Ghrita*	Ghee			8pal(384 ml.)
18	Oil (*TailaTila)*	*Sesame oil*			8pal(384 ml.)
19	Honey	Bee honey			8pal(384 ml.)

Table 5 : Comparison of average values of various quantitative parameters of *Kantkari Avleha*

	Tests/ Organoleptic Parameters	KA	Limits/Method
1.	Colour	Blackish brown	……..
2.	Odour	Sweet odour	……
3.	Taste	Astringent taste	……
4.	Consistency	Semisolid paste	……..

- Limits are as per API Part – 2,Vol -4

	Tests/ Physio-chemical Parameters	KA	Limits/Method
1.	Composition	Satisfactory	By Thin Layer Chromatography
2.	Total Ash Value	2.83 %	NMT- 7.0%
3.	Water soluble Extract (%w/w)	48.64%	NMT – 37.0%
4.	Alcohol Soluble Extract	32.16%	NLT- 25.0%
5.	pH Value	5.0	5.0-6.0%
6.	Acid in soluble Ash (%w/w)	Nil	NMT – 5.0%
7.	Total Solid	98.44%	…….
8	Total suger	32.0%	
9	Reducing suger	12.5%	

- Limits are as per API Part – 2,Vol -4

Fig 1. TLC Plate Image

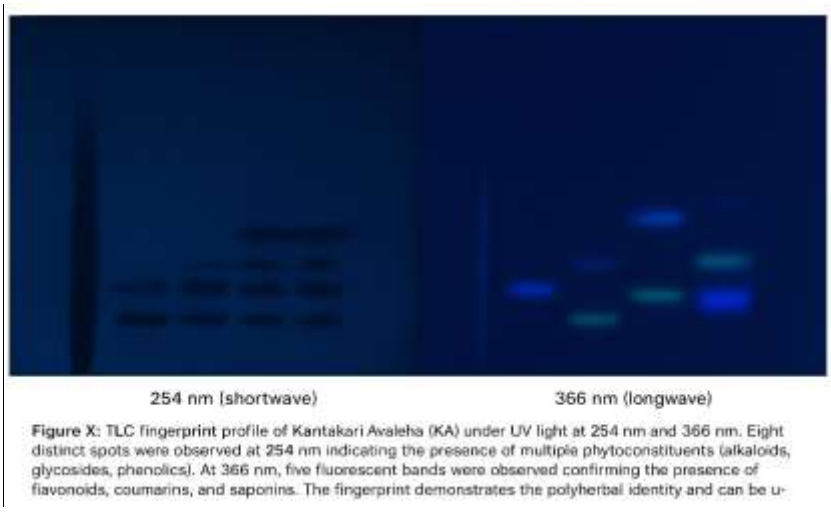


Figure X: TLC fingerprint profile of Kantakari Avaleha (KA) under UV light at 254 nm and 366 nm. Eight distinct spots were observed at 254 nm indicating the presence of multiple phytoconstituents (alkaloids, glycosides, phenolics). At 366 nm, five fluorescent bands were observed confirming the presence of flavonoids, coumarins, and saponins. The fingerprint demonstrates the polyherbal identity and can be u-

***Kantakari Avaleha*(KA)**

Fig.(1-7): *Kantakari Kwatha* Preparation

Fig. (8-9): Added sugar candy to the filtered *Kwatha*

Fig.(10-13): Added *Prakshepa Dravya* after filtered again

Fig.(14): Added *Gritha*

Fig.(15): Added *TilaTail*

Fig.(16-19): Heated over mild fire

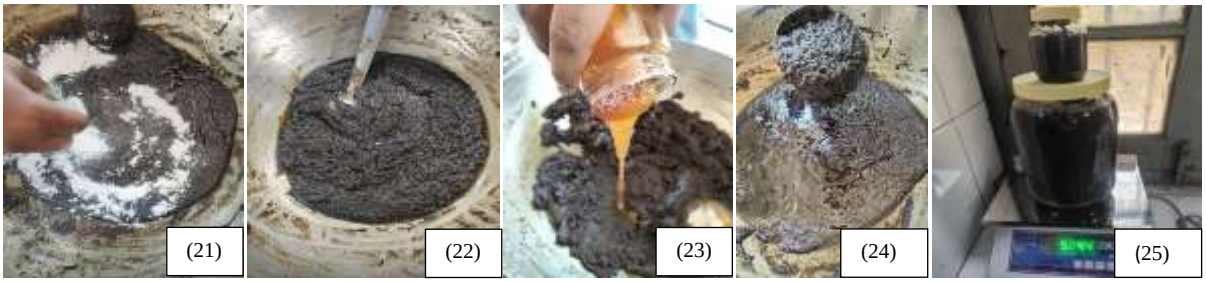
Fig.(20-21): Added *Pippali*and *Vamsalochana* at 60.C

Fig.(22): Mixed well

Fig.(23): Added honey after *Shwangasheeta*

Fig.(24): Mixed well to obtained homogeneous mixture

Fig.(25): Stored in air tight container.



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