

Comparative Pharmaceutico - Analytical Study of Phytoconstituents of Ajamoda Arka, Ajamoda Kashaya and Ajamoda Phanta

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Abstract: *Ajamoda (Apium graveolens, Linn.), recognized for its efficacy in pacifying Vata and Kapha doshas, is a prominent medicinal plant. Its extracts exhibit diverse properties such as Agni deepaka, Hridya, Vrishya, Balakaraka, and Basti Shodhaka. Various methods, including Arka Kalpana, Phanta Kalpana, and Kashaya Kalpana, are employed to extract active principles from Ajamoda, each offering distinct advantages. A comparative analysis reveals that the amount of phytoconstituents extracted in Ajamoda Phanta and Ajamoda Kashaya is more than the Ajamodaarka, as demonstrated by HPTLC studies. However, Ajamoda Arka's sweet taste enhances its palatability. The formulations exhibit acidic pH value, aiding in agni Deepana (improved digestion). Ajamoda Kashaya, however, finds limited mention. Considering parameters such as Rogi bala, Rogabala, and financial considerations, it is concluded that Ajamoda Arka may be suitable for patients with lower strength levels, aversion to bitter formulations, and financial means. Ajamoda Phanta, with higher concentration and affordability, is recommended for individuals with greater strength levels, a preference for bitter formulations, and financial constraints.*

Keywords: Ajamoda Arka, Ajamoda Phanta, Ajamoda Kashaya, Phytoconstituents, HPTLC.

1. Introduction

India is endowed with rich supply of flora and fauna across various states. As it is emphasized in Ayurveda every drug that is available on the planet earth has Medicinal properties in it. Ayurveda aims at not only curing the disease but also to the occurrence of it. In order to achieve this there are various practices that one should follow in their day - to - day life, in spite of this there are various disease that troubles the person and makes his life miserable. This led to the preparation and use of various Pharmacological preparations with the help of various dravyas (Drugs).

Ajamoda (*Apium graveolens, Linn.*) is one among the best drug in pacifying Vata and kapha dosha. The extracts of it also acts as Agni deepaka, Hridya, Vrishya, Balakaraka and Basti Shodhaka¹. Active principles of Ajamoda can be extracted by various methods like Arka Kalpana, Phanta Kalpana and Kashaya Kalpana. Aromatic volatile principles can be extracted to maximum in Arka kalpana. Even though Ajamoda Arka is preferred most of the times due to its palatability, it has its own limitations as it cannot be prepared instantly at household setup by a common person, But Ajamoda Phanta and Ajamoda Kashaya can be easily prepared. Therefore, it is necessary to have a comparative analysis of different preparations of Ajamoda to get clear insight about the potency and amount of active principles extracted in various method of Preparations.

2. Materials and Methods

The active principle of Ajamoda is extracted from its dried fruits in various methods like, Arka preparation, Phanta preparation, Kashaya preparation.

Method of preparation of Ajamoda arka²: 60g of Ajamoda is coarsely pounded and soaked in sufficient quantity of water for 2 - 4 hours. The well soaked drug is transferred to distillation apparatus and 600ml of water is added to it. The mixture is continuously heated till 60% of the distillate is collected and then stored in an air tight bottle.

Method of preparation of Ajamoda Phanta³: The coarsely pounded 75g Ajamoda seeds is taken in a stainless - steel vessel. To it 300ml of boiling water is added, lid is closed over the vessel. When it is still in lukewarm state it is macerated well and filtered.

Method of preparation of Ajamoda Kashaya⁴: 100g of coarsely pounded Ajamoda seeds along with 800ml parts of water is taken in a stainless - steel decoction vessel. The vessel is placed over mild fire, boiled and reduced to one fourth of it and later filtered. The filtrate is obtained and measured.

Organoleptic observations were done for all the three preparations and subjected for physiochemical analysis and HPTC studies.

3. Results

Pharmaceutical results:

- 360ml of Ajamoda Arka is obtained out of 60g of Ajamoda in the process.
- 280ml of Ajamoda Phanta is obtained out of 75g of Ajamoda.
- 200ml of Ajamoda Kashaya is obtained out of 100g of Ajamoda.

Comparative Organoleptic observations of the preparations

Table 1: Comparative Organoleptic observations Ajamodaarka, Ajamoda Phanta, Ajamoda Kashaya

S. no	Parameters	Ajamoda Arka	Ajamoda Phanta	Ajamoda Kashaya
1	Taste	Madhura rasa	Tiktha, Kashaya rasa	Tiktha, Kashaya rasa
2	Smell	Sugandhayukta, Strong characteristic odor	Mild characteristic odor	Mild characteristic odor
3	Opaqueness	clear	Brownish Green turbid solution	Brownish Green, more turbid solution than Ajamodaphanta

Comparative Physicochemical analysis of the preparaions:

Table 2: Comparative Physicochemical analysis of Ajamodaarka, Ajamoda Phanta, Ajamoda Kashaya

Sl. no	Parameters	Ajamoda Arka	Ajamoda Phanta	Ajamoda Kashaya
1	pH	5	6.01	6.12
2	Alkaloid Content	Positive	Positive	Positive
3	Loss of Drying	1hr 30min – 76% 3hr - 100%	1hr 30min – 68% 3hr - 90%	1hr 30min – 85% 3hr - 96%
4	Ash Content	NIL	10%	5%
5	Water Insoluble Ash	NIL	4%	3%
6	Acid Insoluble Ash	NIL	6%	2%
7	Specific Gravity	1.01g/ml	0.914 g/ml	1.02g/ml

HPTLC Study

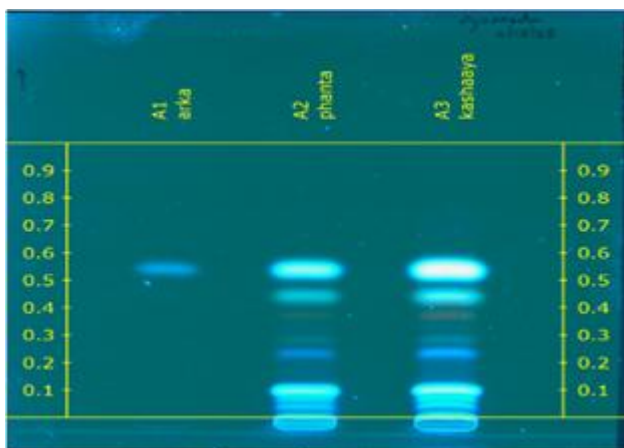


Figure 1: Comparison between TLC Profile of Ajamoda Arka, Ajamoda Phanta and Ajamoda Kashaya under UV Chamber at 366 nm.

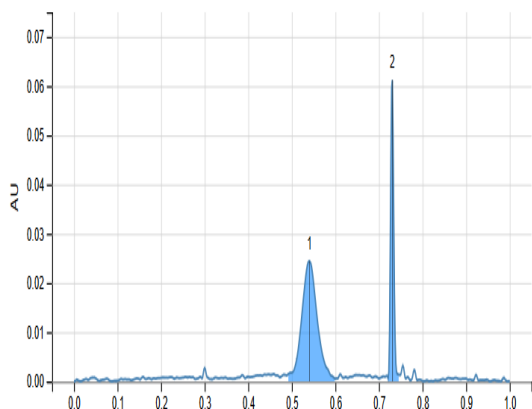


Figure 2: HPTLC Finger print profile of Ajamoda Arka

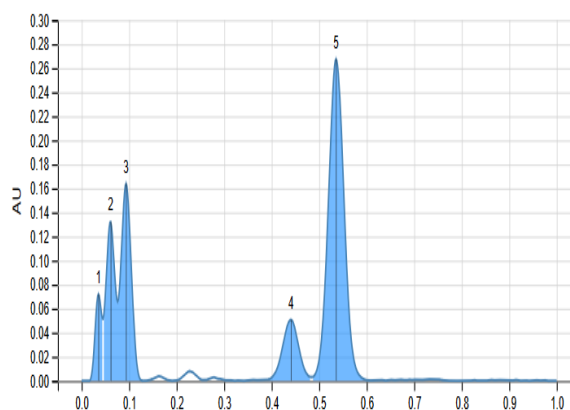


Figure 3: HPTLC Finger print profile of Ajamoda Phanta

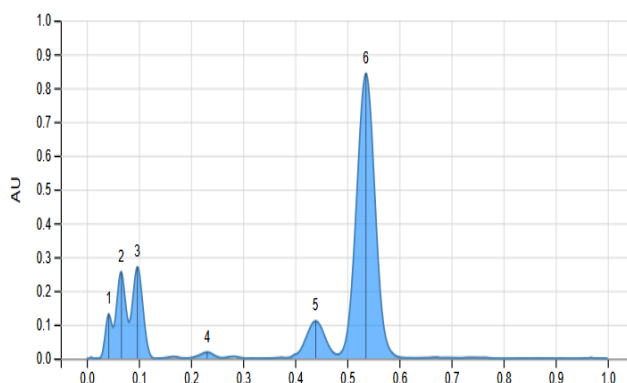


Figure 4: HPTLC Finger print profile of Ajamoda Kashaya

The TLC profile of Ajamodaarka, Ajamoda Phanta and Ajamoda Kashaya under UV 366nm is shown in the fig 1. Under UV 366nm, the Ajamodaarka showed 2 spots at R_f 0.54 and 0.73. The corresponding HPTLC Profile of Ajamoda Arka is shown in the fig 2. The Ajamoda Phanta showed 5 spots at R_f 0.03, 0.06, 0.09, 0.44 and 0.53. The corresponding HPTLC Profile of AjamodaPhanta is shown in the fig 3. The Ajamoda Kashaya showed 6 spots at R_f 0.04, 0.06, 0.09, 0.23, 0.43, 0.53. The corresponding HPTLC Profile of Ajamoda Kashaya is shown in the fig 4.

4. Discussion

Ajamoda Arka is comparatively difficult to prepare as it required sophisticated apparatus and a trained person, while Ajamoda Phanta and Ajamoda Kashya can be easily prepared in a household setup by a common person. The yield obtained in Ajamodaarka is more when compared to Ajamoda Phanta and Ajamoda Kashaya. The recommended dose of Ajamoda Arka is less than Phanta and Kashaya. The palatability of Ajamodaarka is more than the other two as it is Madhura (Sweet) in taste. The volatile active principle is extracted and preserved in Ajamodaarka and Ajamoda Phanta where as in Ajamoda Kashaya the volatile principles are evaporated due to boiling in an open container. The shelf life of Ajamodaarka is greater compared to AjamodaPhanta and Ajamoda Kashaya which is less than 24 hours, but care should be taken while storing Ajamoda Arka as its exposure to surrounding air results in loss of its virya (Potency).

The pH of all the three formulations is less than 7. Therefore, are acidic in nature which helps in agni Deepana (Improves digestion). Ash is the inorganic residue remaining after the water and organic matter have been removed by heating in the presence of oxidizing agents, which provides a measure of the total amount of minerals within a sample⁵. Water insoluble Ash and Acid insoluble Ash is Nil in Ajamoda Arka, signifying that it contains more volatile matters and does not contain any inorganic elements. Whereas Ajamoda Phanta and Ajamoda Kashaya contains little amount of inorganic elements. In HPTLC study, the number of peaks indicated the presence of different phytoconstituents present in the sample. As more peaks are found in Ajamoda Phanta and Kashaya, this shows that the Phytoconstituents of Ajamoda is extracted to the greater extent in Phanta and Kashaya than the Arka.

An examination of various categories of formulations included in the Ayurvedic Formulary of India, shows a wide use of Ajamoda fruit in many processed formulations. Viz Ajamoda Arka, Ajamoda Phanta. Usage of Ajamoda Kashaya is not much mentioned. After examining the various above parameters, we can arrive at the conclusion that Ajamodaarka can be used in the cases when the Rogi bala (Strength of the patient) and Rogabala (strength of the morbidity) is low since the concentration of extracted Phytoconstituents is also low. It can be prescribed to the person having eversion towards tiktakashaya rasa, and to the person who can afford it because the cost of ajamodaarka is more compared to other two preparations. Ajamoda Phanta can be prescribed in the cases where Rogi bala (Strength of the patient) and Rogabala (strength of the morbidity) is Higher since the concentration of extracted Phytoconstituents is also High. It can be prescribed to the person who is satmya (accustomed) towards tiktakashaya rasa, and to the person who is financially weak as it is cheaper than the ajamoda Arka.

5. Conclusion

By the present study, it can be concluded that Ajamoda Phanta and Ajamoda Kashaya are easy for the preparations with minimal infrastructure and have more phytoconstituents whereas Ajamoda Arka have its advantages in its palatability

and lesser dose. However further studies can be done with other analytical techniques and clinical trials.

Acknowledgement:

- I extend my gratitude to RGUHS, Bengaluru for providing financial support.
- I express sincere gratitude to CCRAS Bengaluru for conducting HPTLC studies, and I extend my appreciation to JSS Pharmacy College, Mysuru, for the analytical studies on the sample.

Conflict of interest: Nil

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