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A Comparative Pharmaceutico-Analytical Evaluation of *Dhatryarista* Prepared with Different Fermentative Initiators

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ABSTRACT

Sandhana Kalpana corresponds to alcoholic preparations using natural sources of drugs as ingredients. *Dhataki Puspa* (flower of *Woodfordia fruticosa* (L.) Kurz) is added as fermentative initiators in many*Asava-Arista* preparations as per classical methods. But now-a-days for commercial purpose, yeast is used instead of these to initiate fermentation due to cost-effectiveness and wide availability. To know the actual phyto-chemical difference if any between the *Dhatryarista* prepared from different fermentative initiators, it is necessary to carry out the pharmaceutical & physico-chemical analyses of the prepared samples.Hence a study was designed to evaluate the fact. **Material &methods:** Two samples of *Dhatryarista* were taken for the study. Sample–I was *Dhatryarista* prepared with *Dhataki Puspa* & Sample – II was *Dhatryarista* prepared with yeast as fermentative initiator. Then a comparative pharmaceutical & physico-chemical study of both samples were conducted. **Results:** Early onset & early completion of fermentation was recorded in Sample–II and late in the Sample–I. Both the samples had almost same analytical values except in total solid and total alcohol content which were slightly higher in Sample – II. **Conclusion:** There are no much difference in the role of *Dhataki Puspa* and yeast as fermentative initiators. Yeast has a capability of early onset and completion of fermentation and the sample prepared with it shows little bit higher total solid & total alcohol content.

KEYWORDS

SandhanaKalpana, DhatakiPuspa, Yeast, Dhatryarista, Fermentative initiator

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INTRODUCTION

Ayurveda, the science of life, has different branches & *Bhaishajya Kalpana* is one of them which deal with *Ayurvedic* pharmaceutics. *Sandhana Kalpana* is one such pharmaceutical process where *Asava* and *Arista* are mentioned. *Asavarishta* is a unique preparation of liquid dosage form in the field of *Ayurveda* because it is palatable, fast acting and has longer shelf life period. Role of *Sandhana Dravya* (fermentative initiator) of natural origin *(Dhataki Puspa*etc)[1] is a beautiful scientific concept involved in this process as natural fermentative initiator whereas yeast is a commercially beneficial fermentative initiator in this modern era. *Dhatryarishta*, a formulation prepared by *Sandhana Prakriya*has been described in *PanduRoga Chikitsa* Chapter by *Acharya Charaka* for the treatment of *Pandu Roga*[2].Later it was described in *Bhaishajya Ratnavali* mentioning *Dhataki Puspa* as fermentative initiator. But due to unavailability *Dhataki Puspa* sufficiently for large scale production, yeast is being used instead of it for commercial purpose. Hence the present study has been planned for comparative study between two samples *Dhatryarishta* prepared with *DhatakiPuspa*& yeast as fermentative initiators.

Sample – I: *Dhatryarita* prepared with *Dhataki Puspa*as fermentative initiator

Sample – II: *Dhatryarita* prepared with Yeastas fermentative initiator

AIMS & OBJECTIVES

1. Preparation of *Dhatryarista*Sample –I &*Dhatryarista*Sample –II maintaining SOP.

2. Physico-chemical analysis of both the samples to evaluate the role of fermentative initiators.

MATERIAL & METHODS

Drug Material

All the raw drugs were obtained from local area of Puri,Odisha. The ingredients of *Dhatryarista* (Sample – I & Sample – II) are given in Table 1& 2.

Table1 Ingredients for Sample–I[3]

Sl.No	Name of ingredients	Parts
1	*Amalaki* (*Emblica officinalis*)	1 part
2	*Sarkara* (Sugar)	1/3rd Part
3	*Madhu* (Honey)	1/8th part
4	*Pippali* (*Piper longum*)	1/80th part
5	*DhatakiPuaspa* (*Woodfordia fruticosa* flower)	1/16th part
6	Water for *Kwatha*	8 part

Table 2 Ingredients for Sample - II

Sl. No	Name of ingredients	Parts
1	*Amalaki*(*Emblica officinalis*)	1 part
2	*Sarkara* (Sugar)	1/3rd Part
3	*Madhu* (Honey)	1/8th part
4	*Pippali* (*Piper longum*)	1/80th part
5	Yeast[4]	200mg /litre of liquid
6	Water for *Kwatha*	8 part

Pharmacognostical evaluation

Raw drugs were identified and authenticated by the Pharmacognosy lab, attached to department of Dravyaguna,G.A.M.,Puri,Odisha. The identification was carried out based on the morphological,organoleptic features and also by microscope.

Pharmaceutical study

Method of Preparation:

The pharmaceutical study consists of following practical procedures:

Practical-1: Preparation of *AmalakiKwatha.*

Practical-2 & Practical - 3: Preparation of two samples of *Dhatryarista.*

The two samples of *Dhatryarista* were prepared in Pharmacy attached to the P.G Dept. of RS &BK,Gopabandhu Ayurveda Mahavidyalaya,Puri maintaining S.O.P.

In practical no –1, *AmalakiKwatha* was prepared by taking 8 part water & reducing it to 1/8thon 18-12-2017. Then it was divided into two equal parts for two samples of *Dhatryarista*.In practical no – 2 & practical no – 3, the two equally divided*kwathas*were added with sugar, honey& *yavakutachurna* of *Pippali*. Lastly, in practical no – 2*DhatakiPuspa* was added for sample – I & Yeast was added in practical no – 3 for sample – II. Then the two samples were filled into two previously fumigated & smeared earthen pots& closed with *Saravas.* The pots were placed in a peaceful and dark room of the pharmacy on 19-12-2017 and were observed.

Onset of fermentation was observed first (on 8th day - 26.12.2017) in Sample – II and later on 10thday -28.12.2017day in Sample – I. The two pots were subjected to *Sandhivandhana* by mud and cotton cloth. Then both are kept under observation. Also, the completion was first observed in sample –II (on 27th day-14.01.2018) & later in sample – I (on 30th day -17.01.2018).The onset of fermentation was confirmed by bubbling sound coming from the pot, by burning candle test which was positive & by lime water test which was negative. Likely completion was confirmed by absence of bubbling sound, +ve burning candle test & -ve lime water test.

Method of Physicochemical evaluation[5,6,7]

The two samples were analysed by using standard qualitative & quantitative parameters as per CCRAS guidelines. The samples were analysed at ALN Rao Memorial Ayurvedic Medical College and PG Centre Koppa, Karnataka. Organoleptic test, qualitative, quantitative, tests & phytochemical studies were carried out by following standard procedures. Thin layer chromatography (TLC) studies were carried out with chloroform extract on pre-coated silica gel. The mobile phase used was Ethyl acetate: Methanol: Chloroform:

80:10:10. The results are given in Table 3, 4 and 5.

RESULTS

Table 3 Comparative Organoleptic test results

Sl. no.	Parameters	*Dhatryarista* sample-I	*Dhatryarista* sample-II
1	Colour	Brown	Brown
2	Odour	Characteristic aromatic	Characteristic aromatic
3	Taste	Sweet, astringent, Slightly bitter	Sweet, astringent, Slightly bitter
4	Touch	Liquid	Liquid

Table 4 Comparative physic chemical test results

Sl. no.	Parameters	*Dhatryarista* sample-I	*Dhatryarista* sample-II
1	pH	3.86 ± 0.10	3.65 ± 0.10
2	Specific Gravity	1.2425	1.2340
3	Specific Gravity (Distillate)	0.9950	0.9932
4	Total solid	42.72%	39.24%

The physico chemical parameters show almost same value in both samples and within normal limit.

Table 5 Comparative phyto-chemical test results

Sl.No.	Name of the sample	Phyto-chemical tests & results							
		carbohydrate	protein	Alkaloid	Cardiac glycoside	flavanoids	Tannins	Anthraquinone	Tripenoids
1	Sample-I	+ve	-ve	-ve	+ve	+ve	+ve	+ve	+ve
2	Sample-II	+ve	-ve	-ve	+ve	+ve	+ve	+ve	+ve

Qualitative test of two sample of Dhatryarista showed same results.

Table 6 Comparative quantitative test results

Name of the Tests	Sample -I	Sample-II
Reducing Sugar	13.45%	14.25%
Non-reducing sugar	2.16%	1.34%
Total Alcohol	13.40%	14.69%
Total phenol	214 ± 23.55	215 ±24.12

Reducing Sugar, Non-reducing sugar,Total Alcohol, Total phenol are the important parameters for quantitative estimation of a*Asavarista*sample. In present study Sample – II showed slightly more alcohol percentage (Table 6).

The samples exhibited similar spots in mentioned solvent system. None of spots was noted under visible light either before or after derivatization.

Table 7 Comparative result of TLC

Spots	Colour under long UV before spray	Colour under long UV after spray	R_f values
1	Light fluorescent blue	Light fluorescent green	0.06
2	Light fluorescent blue	Light fluorescent green	0.16
3	Light fluorescent blue	Light fluorescent green	0.31

4	Light fluorescent blue	Light fluorescent green	0.39
5	Light fluorescent blue	Light fluorescent green	0.57
6	Light fluorescent blue	Light fluorescent green	0.84

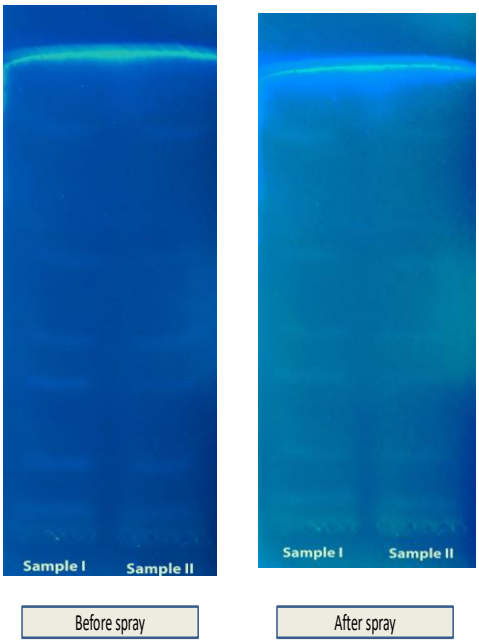

Fig 1 Results of TLC before & after spray

DISCUSSION

Evidence based principles are the need of the time for wide acceptability. To know the actual difference in the role of fermentative initiators, a comparative study between two prepared samples of *Dhatryarista* with two different fermentative initiators i.e *Dhataki Puspa* & Yeast is carried out. Due to the cold season, the onset of fermentation is seen 3-4 days late in both cases in comparison to other season. Also the completion of fermentation is seen late in both cases. But between the both samples, the onset is quicker in Sample – II (Yeast as fermentative initiator) and duration of completion is also shorter. The organoleptic characteristics are almost equal in both the cases (which are mentioned in table no.3). There are almost similarity in pH value of *Dhatryarista* - I & *Dhatryarista*– II i.e. 3.86 and 3.65 respectively (which are mentioned in table no.4). Specific gravity is also same i.e. 1.2425 & 1.2340(which is mentioned in table no.4). There is slight difference in total solid contents of two samples of *Dhatryarista* i.e. 42.72 % & 39.24% respectively (which are mentioned in table no.4). Total alcohol content is also slightly different i.e. 13.40% & 14.69 % (which are mentioned in table no.6). In TLC no spots was noted under visible light either before or after derivatization (as mentioned in table no.7 & in figure no.1).

CONCLUSION

The aim of present study was to know the role of fermentative initiators used for preparation of *Dhatryarista*. From the observations of pharmaceutical study, it can be concluded that the onset and completion of fermentation is fast in *Dhatryarista* sample – II. Comparative analytical assessment between two samples of

Dhatryarista exhibits almost same values in both samples except in total solid and total alcohol content. But these are within the limits and the difference in the values is insignificant. So it can be concluded that *Dhatryarista* Sample – II has almost equal properties with *Dhatryarista* Sample – II and there are no much difference between the roles of different fermentative initiators which can be chosen according to suitability.

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