

# A Comparative Pharmaceutico-analytical Study of *Tambulasava* and its *Arka*

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## ABSTRACT

Since ancient times there are countless fermented preparations stated in Ayurvedic pharmaceutics. These preparations are organized through a special progression known as *Sandhana Kalpana*<sup>1</sup>. Whereas in *Arka Kalpana*<sup>2</sup> the volatile content from the various drugs along with the self-generated alcohol will be produced in its purest form. With its higher potency, reduced dosage requirements, longer self-life, improved palatability, faster absorption, quicker action and better patient compliance *Arka Kalpana* stands out as the first choice to meet the growing demands of the present population. A comparative pharmaceutico-analytical study was conducted with *Tambulasava*<sup>3</sup> as first product and its modified product of *Tambulasava Arka*. *Tambulasava* prepared as per the classical *Sandhan Kalpana* method and subjected to Pharmaceutico-analytical study. Later *Tambulasava* was subjected to *Arka Kalpana* as per classical *Arka Kalpana* method and then further subjected to Pharmaceutico-analytical study. Firstly, *Tambulasava* prepared and tested for its quality and purity by subjecting organoleptic characteristics like color, taste and odor etc, physiochemical analysis<sup>4</sup> like Acid value, pH value, Alcohol content, microbial contaminations etc. From this *Tambulasava* half of its part preserved and the other half subjected to distillation and the distillate tested for its quality by organoleptic and physiochemical analysis<sup>5</sup>. Physio-chemical evaluations found satisfactory. *Tambulasava Arka* has shown better product stability based on concentration of alcohol and microbial load. Microbial count was also improved after Modification to *Arka* with aids the product stability of the product. The total dissolved solids including reducing and non-reducing sugar became zero after product modification which made the product available to the patients with diabetes.

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**KEYWORDS:** *Sandhana Kalpana*, *Arka Kalpana*, *Tambulasava*.

## INTRODUCTION

*Sandhana Kalpana* and *Arka kalpana* are one among the dosage forms of *Ayurveda* in practice since thousands of years. To prepare these medicaments, certain sets of conditions are prearranged, which leads to fermentation and distillation processes. Thus, products bequeath with self-generated alcohol, which potentiate these preparations, pharmaceutically and therapeutically. Rendering to the process involved, the *Sandhana Kalpana* is of two types *Madya Kalpana*<sup>6</sup> and *Shukta Kalpana*. *Madya* group of formulations, self-generated alcohol is formed e.g.

*Asava* & *Arishta* etc. Whereas in *Shukta* group of formulations, there will be formation of *Amla* (acid) e.g. *Sauveera* & *Tushodaka* etc.

*Gadanigraha* elucidating a special *Sandhana Kalpana* for *Arsha Roga* under the name of *Tambulasava* which is a rare combination of many volatile oil containing drugs. Usually, *Asava* has some sediments through which it will endure into secondary fermentation by producing citric acid within it, which tends to reduce palatability further. It

also has large dosage form and has a fair amount of sugar content too within it. In addition to this, the formulation will be more suitable for paediatric as well as Type two diabetes mellitus patients' usage. Therefore, the modification of *Tambulasava* in *Arka kalpana* and their pharmaceutico-analytical study of both the formulation is planned without violating the basic principles of *Ayurveda*. Hence the present study deals with the evaluation of pharmaceutico-analytical study of both *Tambulasava* and its *Arka*.

## Materials and Methods

### Source of Data

- **Literary source:** All classical, modern literature and contemporary texts including the journals and

website about the crude drugs, procedures and equipments was reviewed and documented for the study.

- **Drug source :** The crude drugs were collected from the local market after proper identification and all the necessary processings were done in department of Rasashastra and Bhaishajyakalpana of BMJAMC, Hospital and PG Center Gajendragadha.
- **Analytical source:** Prepared samples of the products were sent to Shri Atharva Ayurveda Rasayanshala Lalganj Raebareli Uttar Pradesh for the analytical evaluation and reporting.

## Results:

### Organoleptic Results of *Tambulasava*

Observation	<i>Tambulasava</i> Batch I		<i>Tambulasava</i> Batch II	
	Before Fermentation	After Fermentation	Before Fermentation	After Fermentation
<i>Rupa</i>	Light Brown	Dark Brown	Light Brown	Light Brown
<i>Rasa</i>	<i>Madhura, Tikta, Kashaya.</i>	<i>Madhura, Tikta, Kashaya.</i>	<i>Madhura, Tikta, Kashaya.</i>	<i>Madhura, Tikta, Kashaya.</i>
<i>Gandha</i>	Smell of <i>Guda &amp; Madhu.</i>	Strong Alcoholic Smell.	Smell of <i>Guda &amp; Madhu.</i>	Strong Alcoholic Smell.
<i>Shabda</i>	Nil	Nil	Nil	Nil
Condition of <i>Sandhana Dravya</i>	Floating	Settled	Floating	Partially Floating
Candle Test	+ve	-ve	+ve	-ve
Lime water Test	+ve	-ve	+ve	-ve

### Organoleptic Results of *Tambulasava Arka*

Observation	<i>Tambulasava Arka</i> Batch I	<i>Tambulasava Arka</i> Batch II
<i>Rupa</i>	Clear Watery	Clear Watery
<i>Rasa</i>	<i>Tikta</i>	<i>Tikta</i>
<i>Gandha</i>	<i>Madya, Mixed Herb.</i>	<i>Madya, Mixed Herb.</i>
<i>Shabda</i>	-ve	-ve
Condition of <i>Arka</i>	Clear	Clear

### Physio-chemical Analysis Results of *Tambulasava*

Parameters	Batch I	Batch II
pH	4.12	3.86
Specific gravity at 25°C	1.1288	1.1612
Total Soluble Solids %	58.50	61.00
Alcohol Content % v/v	6.25	6.85
Reducing Sugar % w/v	48.66	46.28
Non reducing Sugar	8.60	6.22
Refractive Index	1.3650	1.4124

### Physio-chemical Analysis Results of *Tambulasava Arka*

Parameters	Batch I	Batch II
pH	6.10	6.12
Specific gravity at 25°C	0.9925	0.9962
Volatile Matter	11.52	11.86
Alcohol Content % v/v	10.78	11.26
Clarity Test	Clear	Clear

**Test for heavy metals**

Metals	<i>Tambulasava</i>		<i>Tambulasava Arka</i>	
	Batch I	Batch II	Batch I	Batch II
Lead	0.01 ppm	0.01 ppm	Not found	Not found
Cadmium	Not found	Not found	Not found	Not found
Mercury	Not found	Not found	Not found	Not found
Arsenic	Not found	Not found	Not found	Not found

**Test for Microbial Contaminations**

Metals	<i>Tambulasava</i>		<i>Tambulasava Arka</i>	
	Batch I	Batch II	Batch I	Batch II
E coli	Absent	Absent	Absent	Absent
Salmonella spp.	Absent	Absent	Absent	Absent
S. Aureus	Absent	Absent	Absent	Absent
Pseudomonas aeruginosa	Absent	Absent	Absent	Absent

**Test for Pesticide residue**

Metals	<i>Tambulasava</i>		<i>Tambulasava Arka</i>	
	Batch I	Batch II	Batch I	Batch II
Organochlorine pesticides	0.02 PPM	0.02 PPM	Absent	Absent
Organophosphorus pesticides	0.02 PPM	0.02 PPM	Absent	Absent
Pyrethroids	Not found	Absent	Absent	Absent

**Discussion**

*Tambulasava Arka* is a modified form of *Tambulasava* mentioned in *Gada Nigraha Arshorogadhikar*. The *Tambulasava* modified in *Arka* form gives more potency, better palatability, broad usage and better self-life due to low bacterial and fungal count and high concentration of alcohol comparative to *Tambulasava*.

The *Tambulasava* made according to the classical *Sandhana Kalpana* method, then modified into *Tambulasava Arka* as per the classical method mentioned in *Arka Prakasha*. All the Physio-chemical test values are under permissible limit as mentioned in API.

In the present study *Tambulasava* has pH of 3.86 to 4.12 with the alcohol concentration of 6.25 to 6.85 % v/v but after modification in the form of *Arka* pH was 6.10 to 6.12 with the alcohol concentration of 10.26 to 10.78 % v/v.

Microbial count was also improved after Modification to *Arka* with aids the product stability of the product. The total dissolved solids including reducing and non-reducing sugar became zero after product modification which made the product available to the patients with diabetes.

**Conclusion**

*Tambulasava Arka* is a modified form of *Tambulasava* mentioned in *Gada Nigraha Arshorogadhikar*. The *Tambulasava* modified in *Arka* form gives more potency, better palatability, broad usage and better sterility due to low bacterial and

fungal count and high concentration of alcohol comparative to *Tambulasava*.

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