

## Comparative Physico-Chemical Evaluation of Some Branded Formulation of Drakshasava

Milind Pande<sup>1\*</sup>, Naman Tyagi<sup>1</sup>, Bruno O Onyemegbulem<sup>2</sup>, Subas C Dinda<sup>1</sup> and J C Aguiyi<sup>2</sup>

<sup>1</sup>College of Pharmacy, Teerthsankar Mahaveer University, Moradabad, UP, India

<sup>2</sup>Africa Centre of Excellence in Phytomedicine Research and Development, (ACEPRD) University of Jos, Nigeria

\*Corresponding Author: Milind Pande, College of Pharmacy, Teerthankar Mahaveer University, Moradabad, UP, India.

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### Abstract

**Background and Objective:** Asava and Arishta are Ayurvedic preparations that contain self-generated alcohol content and herbal extracts soluble in both water as well as alcohol. Under Ayurveda drakshasava used as traditional tonic. Because of drakshasava obtained from grape juice, which may be fermented and leads to act as weak wine.

**Materials and Methods:** Drakshasava samples of two reputed brands were procured from market and subjected for various physico-chemical evaluation parameters like organoleptic characterization, specific gravity, viscosity, refractive index, Alcohol content, total solid content, sugars (both reducing & non-reducing) using official procedure.

**Results:** The Brand I were determined as per the method given in Pharmacopoeia and was found to be total solid content  $23.96 \pm 0.21\%$ , specific gravity  $1.09 \pm 0.02$  g/cc, alcohol content  $1.52 \pm 0.10\%$  and reducing sugars and non-reducing sugars ( $9.07 \pm 0.11$ ,  $1.21 \pm 0.10$ ) respectively. After physical evaluation results of Drakshasava belongs to Brand-I found to be complied with pharmacopoeial standard values. The Brand II were determined as per the method given in Pharmacopoeia and are found to be total solid  $25.37 \pm 0.24\%$ , specific gravity  $1.10 \pm 0.03$  g/cc, alcohol content  $9.11 \pm 0.16\%$  and reducing sugars and non-reducing sugars respectively.

**Conclusion:** Brand I showed lesser reading as compared to sample Brand II. It may be due to storage or faulty manufacturing process. End conclusion of the research is Brand I is good and most effective on the different parameters of standardization.

**Keywords:** Asava; Drakshasava; Ayurvedic formulation; Traditional Medicine

### Introduction

Herbal formulations gain importance because of their minimum toxicity, biocompatibility, and margin of safety [1]. Thus, the vigorous use of traditional herbal medicines has prompted the evaluation of these bioactive compounds by following proper standard methods [2]. According to some reports the ingredients of these herbal formulations are being adulterated with inferior quality drugs/ nondrug adulterants [3].

Drakshasava is a traditional Ayurvedic tonic made from grapes and act as weak wine because the grape juice which is partially fermented may also be added with resins [4]. It is found to be beneficial for maladies such as lethargy, weakness and exhaustion. Its believed to be used to relieve Vata-Vayu-Dosha and said to be useful in treating cardiac disorder, hemorrhages in Ayurvedic system of medicines. The Sanskrit word "Draksha" means grape and "Asava" means distillate or extract. Drakshasava is formulation found in Sushruta Samhita, a book of remedies under Ayurveda during 3<sup>rd</sup> to 4<sup>th</sup> century CE [5].

Even though the above formulation have been used in India since many years but not recognized officially may be due to unavailability of proper research data and standardization of methodology pertaining to its formulation development. However, some researchers attempted for physico-chemical characterization of its marketed formulation and in-house prepared Asava and Arista formulations [6].

In Ayurvedic formulation medicinal plant materials play very vital role in management of health care systems and those plant materials gaining popularity day-by-day in many developed countries to be used as alternative to health remedies. WHO recommended various standardization processes setting various testing parameters to enhance its acceptability and monitor its quality to assure safety use of drug and its formulations. There was no evidence of such comparative study in literature. Hence authors were decided to evaluate two reputed brands of drakshasava from Indian market for comparative study on quality parameters selected [7].

### Materials and Methods

The study was conducted in Department of Pharmacognosy, TMU Moradabad. The study was commenced after the relevant approvals from the concerned authorities as well as the departmental research committee [8-13].

#### Collection of drakshasava formulations

Drakshasava Formulations of two reputed brands of Moradabad area medical stores with fresh manufacturing date were purchased. All evaluations were carried out as per procedure given below.

#### Experimental

##### Organoleptic characterization

Both samples were subjected to organoleptic evaluations such as colour, odour, taste and appearance.

##### Determination of total solids contents

Accurately weighed quantity of 5 ml sample placed in flat bottom flanged dish and placed on water bath for slow evaporation of solvents at 105°C. The left out residues were measured after complete drying.

##### Determination of alcohol content

The sample preparation (25 ml) was accurately measured, transferred to a distillation flask and, diluted with 150 ml of distilled water. From this, more than 90 ml of distillate was taken into a 100 ml volumetric flask. The relative density was determined by maintaining the temperature at 24 - 25°C. The percentage of ethanol contained in the preparation was determined.

##### Determination of pH

The acidity or alkalinity of Asava was studied by potentiometric method at room temperature following procedure of Indian pharmacopoeia-1996.

##### Determination of refractive index

The refractive index was conveniently measured using the Abbe refractometer at 25°C employing the wavelength of the D line of sodium ( $\lambda = 589.3$  nm), after calibrating the apparatus against distilled water whose  $n_{D20}$  at 25°C was 1.3225.

##### Determination of viscosity

The viscosity of Asava was carried out using capillary viscometer at room temperature.

##### Determination of weight per ml

The weight per ml of a liquid is the weight, in g, of 1 ml of the liquid when weighed in air at room temperature. The weight per ml of the liquid was determined using Pycnometer at room temperature. The value was determined as the average of three times repetition of the experiments.

## Determination of presence of Sugar

### Reducing sugar

The 20 ml of Drakshasava was taken and neutralize with sodium hydroxide and evaporated the solution to half volume on water bath at 50°C to remove alcohol followed by cooling and addition of 10 ml of 21.9 gm of zinc acetate, 3 ml of glacial acetic acid, 10.6 gm of potassium ferro-cyanide and distilled water to make up to 100 ml. After that two ml of Methylene blue indicator was added. Resultant solution was titrated with Fehling solution from burette till end point brick red colour appeared.

### Non reducing sugar

The 20 ml of Drakshasava sample was taken to which distilled water was added and boiled for 30 minutes in a water bath. After that it was cooled down and its pH was brought to 7. Then volume was made 100 ml by addition of distilled water. Then 10 ml of Fehling solution was added and solution was titrated till blue colour appeared. Afterword two drops of methylene blue were added followed by titration till brick red colour was obtained.

### Statistical analysis

Experimental values were expressed as Mean  $\pm$  SD. The data were subjected to one way analysis of variance (ANOVA) followed by Bonferroni's multiple comparison test. A value of  $p < 0.05$  was considered as significant.

## Results

### Organoleptic characterization

Organoleptic (lit. impression on the organs) this include evaluation by sensory organs for morphological identification. Various parameters like colour, odour, taste, shape and size as per preliminary Pharmacognostic evaluation. A very preliminary level study was carried out and results depicted as follows. All parameters were same accept colour variation as shown in table 1.

S No	Particulars	Observation value of Brand I	Observation value of Brand II
1	Colour	Dark brown	Very dark brown
2	Taste	Sweet	Sour
3	Odour	Aromatic	Aromatic
4	Appearance	Clear	Clear

**Table 1:** Showing results of organoleptic characterization of Drakshasava.

### Qualitative tests for carbohydrates

Both brands were subjected to preliminary qualitative testing for biochemical parameters showed almost all tests were positive as shown in table 2.

S No	Tests	Observation value of Brand I	Observation value of Brand II
1	Molish's Test	+	+
2	Fehling's Test	+	+
3	Benedict's Test	+	+
4	Barfored's Test	+	+

**Table 2:** Showing results confirmation tests (Qualitative) of Drakshasava.

### Physico-chemical evaluations

As applicable and availability of proper methods and required instruments physico-chemical evaluations were carried out for both brands of Drakshasava for comparative studies as shown in table 3.

S No	Parameters	Specification as per Ayurvedic Pharmacopeia of India	Observation value of Brand I	Observation value of Brand II
1	pH	4.0-4.5	4.56 ± 0.05	4.46 ± 0.06
2	Total solids (% w/w)	Not Less Than 25.0	23.96 ± 0.21	25.37 ± 0.24
3	Specific gravity at 25°C (g/ml)	1.08-1.20	1.09 ± 0.02	1.10 ± 0.03
4	Reducing sugar (% w/w)	Not Less than 16.0	9.07 ± 0.11	13.15 ± 0.18
5	Non-reducing sugar (% w/w)	Not More Than 0.80	1.21 ± 0.10	1.69 ± 0.17
6	Alcohol content (% w/w)	5-10	1.52 ± 0.10	9.11 ± 0.16
7	Viscosity cp	2.10-3.10	2.04	2.93
8	Refractive Index	1.469 to 1.471	1.39	1.38

**Table 3:** Showing results of Physico-chemical evaluations of Drakshasava.

### Discussion

The experiments were conducted to determine physico-chemical parameters and compare the quality in between two marketed formulations of Drakshasava following harmonized methods as prescribed by Ayurvedic pharmacopoeia of India.

Evaluation studies based on organoleptic evaluations such as colour, taste, odour and appearance of both marketed products viz, Brand I and Brand II drakshasava were done. We found all samples of different brands of drakshasava comply as per standard values given in official reference books.

The values for pH of drakshasava samples from various suppliers revealed that all the drakshasava samples were acidic in nature.

About physico-chemical parameters the result of these two formulations were found to be having pH (4.56, 4.46), refractive index (1.39, 1.38), specific gravity (1.09, 1.10), viscosity (2.04, 2.93), alcohol content (1.52% v/v, 9.11% v/v) and total solid content (23.96% v/v, 25.37% v/v) respectively. In comparison it was found the Brand II formulation shows higher values of standard parameters in comparison to Brand-I formulation.

### Conclusion

The earlier pharmacological study of Drakshasava in cyclophosphamide induced weight loss and reduction in crown-rump length in developing mice embryo indicate it's safe to be used in pregnant mice and having no side effects even in non-pregnant one [14]. Therefore, we have studied and evaluated two different brands of drakshasava viz: Brand I and Brand II drakshasava products and evaluated them on different physico-chemical parameters. Brand I found to be having standard one in comparison to Brand-II. Regarding Brand II, because of some parameters towards higher sides of limit reason may be careless follow-up during process of manufacturing of formulation. End conclusion of the research is Brand I is good and most effective on the different parameters of standardization. Due to legal restriction we cannot disclose the names of actual manufacturer.

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