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Research Article

EVALUATION OF QUANTITATIVE PARAMETERS OF AYURVEDIC FORMULATION: KANKASAVA

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ABSTRACT

Information on the quantitative parameters of Aasava i.e. Kanakasava to guarantee the quality and the safety of the product to the consumer is less. In recent study quantitative parameters of few brands of Kanakasava have been evaluated as per WHO guidelines. Mean P^H and Mean acid value of formulation were found to be 4.153-4.231±0.344 and 4.914± 0.751 .It indicates weak acid properties of Kankasava.Ethanol content of Kankasava was measured by two methods and found to be within the limit. Ethanol content by Specific Gravity method was found to be 2.15±0.788 and by GCmethod was1.513±0.388.Both methods were accurate and precise.

Keywords:-Standardization, Kankasava, Quantitative parameters, Ethanol content, Specific gravity, GC.

INTRODUCTION

Aasava have been used as medicines far over 3000 years to treat various disorders and are also taken as appetizers and stimulants. Aasava are liquid preparations containing self generated alcohol, thus contain water soluble as well as alcohol soluble substances of the drugs. Due to their medicinal value, sweet taste, and easy availability people are prone to consume higher doses of these drugs for longer periods. [I]Kanakasava is common Ayurvedic preparation belonging to Aasava category, generally prepared by soaking the drugs in the powdered form or in the form of their decoction (known as Kasaya in Ayurveda), in a solution of sugar or Jaggery (Gur), for a specified period of time. During soaking, it undergoes fermentation generating alcohol and in process facilitating extraction of active constituents contained in the drug.[II]

Standardization is a burning topic in Ayurvedic drug industry today. Information on the quantitative parameters of Aasava i.e. Kanakasava to guarantee the quality and the safety of the product to the consumer is less. [III] Therefore, establishing quality and standard parameters like alcohol level, pH, acid value, total viable count and boiling point other of this preparation is highly significant. The objective of this study was to determine the level of alcohol, acidity and pH in commercially available Kanakasava to establish a routine procedure for standardization of this Ayurvedic preparation.

MATERIALS AND METHODS

Three brands of Kanakasava have been selected of reputed companies and coded to avoid conflict of interest as A,B,D. Randomly two batches from each brand were used for the study and named as Aa,Ab,Ba,Bb,Da,Db.

All the chemicals and solvents used for the study were of analytical grades.

Determination of pH of the formulation

The digital P^H meter was used, and calibrated using Buffer tablets of P^H 4.00 and P^H 7.0. [III, IV]

Determination of P^H was done at three levels as

- At the opening of bottle.
- After 7 days of opening of bottle.
- After 14 days of opening of bottle.

Determination of acid value

10g of formulation was dissolved in 50ml of equal volume of ethanol and ether previously neutralized with 0.1M KOH to Phenolphthalein solution. To it 1ml of phenolphthalein solution was added and titrated with 0.1M KOH until solution remains faint pink after shaking for 30sec. [III, IV]

Determination of alcohol content

Ethanol content by distillation and specific gravity

25ml of the preparation being examined was transferred, accurately measured at 24.9° to 25.1°, to the distillation flask. It was diluted with 150ml of water and to it added a little pumice powder. It was distilled and not less than 90ml of the distillate was collected into a 100-ml volumetric flask and diluted to volume with distilled water at 24.9° to 25.1°. Relative density at 24.9° to 25.1°was determined and alcohol content was calculated from the table. [V]

Ethanol content by gas chromatography

A simple ,rapid ,precise and accurate GLC Method was used for determination of ethanol in marketed preparation of Kanakasava using FID.GCanalysis was performed using carbowax 20M (stationary phase)Packed into steel column with internal diameter of 2mm. Nitrogen was used as carrier gas at a flow rate of 1 $Kg/cm^2/min$.

A range of standard solutions of ethanol was prepared containing1, 2, 3, 4, 5% v/v of ethanol using ethanol (99.98%) and HPLC grade water. From the standard solution 1ml was diluted to 10ml with HPLC grade water. Then 1 micro ml of solution was injected and chromatogram was recorded. The area was plotted against concentration of ethanol to obtain a calibration graph.

For the assay, 25ml of syrup was taken in a 500ml distillation flask. To this 5ml of 0.1N sodium hydroxide solution, 10mg of phenolphthalein powder and 150ml of HPLC grade water were added Resulting mixture was heated to110^0c and 100ml of distillate was collected. Distillate (1ml) was diluted to 10ml with HPLC grade water& an aliquot of this solution was analyzed as described earlier and chromatogram was noted. [I, VII, VIII]

RESULTS AND DISCUSSION

pH of formulations were measured at three different levels and found as follows.

Table 1: pH of formulation at the opening of bottle

Sr.No.	Sample No.	Mean pH
1	A_a	4.33± 0.007
2	Ba	4.34±0.01
3	D_a	3.82± 0.02
4	A_b	4.72± 0.014
5	B_b	4.39± 0.007
6	D_b	3.94± 0.007

Table 2: pH of formulation after 7 days of opening of bottle

Sr.No	Sample No.	Mean pH
1	A_a	4.34 ± 0.01
2	B_a	4.31 ± 0.007
3	D_a	3.80 ± 0.007
4	A_b	4.69 ± 0.007
5	B_b	4.38 ± 0.01
6	D_b	3.90 ± 0.007

Table 3: pH of formulation after 14 days of opening of bottle

Sr.No.	Sample No.	Mean pH
1	A_a	4.32 ± 0.017
2	B_a	4.32 ± 0.012
3	D_a	3.78 ± 0.026
4	A_b	4.70 ± 0.01
5	B_b	4.37 ± 0.007
6	D_b	3.90 ± 0.01

Acid values were found as follows.

Table 4: Acid value of formulation

Sr.No.	Sample No.	Mean Acid Value
1	A_a	1.085 ± 0.48
2	B_a	1.07 ± 0.20
3	D_a	1.039 ± 0.23
4	A_b	1.072 ± 0.27
5	B_b	0.993 ± 0.18
6	D_b	1.032 ± 0.21

Measured pH and acid values indicate that all Kanakasava formulations have weak acidic properties.

Ethanol content by specific gravity method was measured by using specific gravity and alcohol content chart [IV] and shown as follows.

Table5: Ethanol content by specific gravity method

Sr.No.	Sample No.	%Ethanol (v/v)
1	A_a	2.4 ± 0.41
2	B_a	1.6 ± 0.52
3	D_a	1.4 ± 0.35
4	A_b	2.4 ± 0.35
5	B_b	3.5 ± 0.31
6	D_b	1.6 ± 0.25

Table 6: Ethanol content by GC method

Sr.No.	Sample No.	%Ethanol (v/v)
1	A_a	1.166±0.076
2	B_a	2.08±0.057
3	D_a	1.41 ± 0.017
4	A_b	1.083±0.028
5	B_b	1.86 ± 0.058
6	D_b	1.48 ± 0.017

In Ethanol content by GC method area of each peak of standard was plotted against concentration of ethanol to obtain calibration graph. (Figure I).

Calibration curve was found to be linear over concentration range1-5%v/v (R=0.998).The method was found to be accurate and precise.

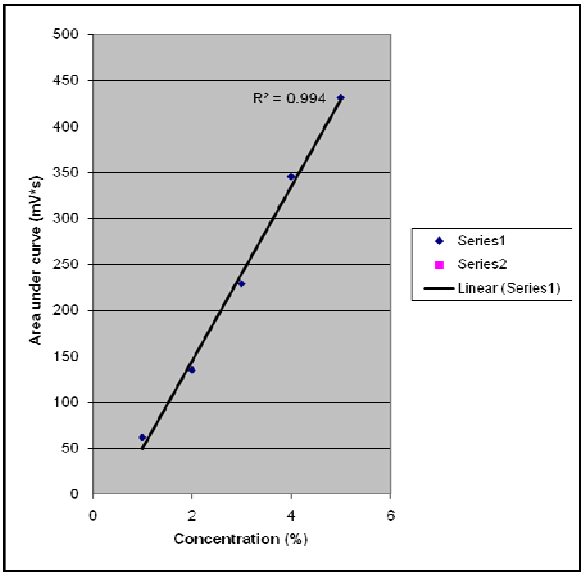

Fig. 1: Calibration Graph

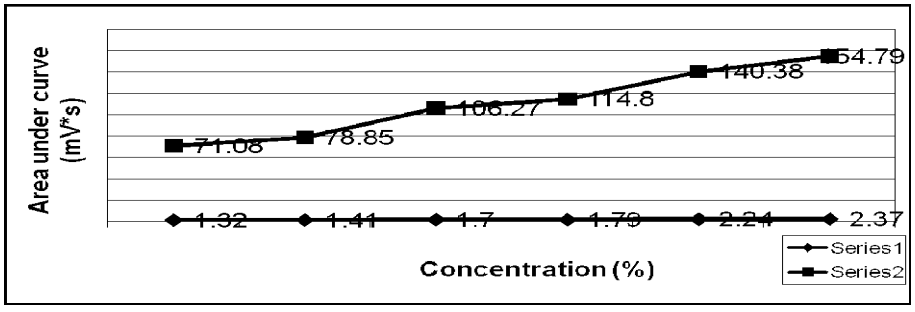

Fig. 2: Graph of concentration versus peak area

Peak area of sample were plotted against concentration using calibration graph and concentration of ethanol were measured.(Figure 2).

Mean P[H] and Mean acid value of formulation were found to be 4.153-4.231±0.344 and 4.914± 0.751. It indicates weak acid properties of Kankasava. Ethanol content by Specific Gravity method was found to be 2.15±0.788 and by GCmethod was1.513±0.388. i.e. measured ethanol content from both methods has comparable values and those are within the labeled claim and also less than rectified spirits. Therefore it can be concluded that the recorded levels of alcohol, acidity, and pH in commercially available Kanakasava could be used to establish and formulate procedures for standardization and quality controlling of this ayurvedic preparations.

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