Herbal Drug Technology

Practical No. 2

Aim: Determination of the alcohol content of Asava and Arista.

References

1. Ayurvedic Pharmacopoeia of India (API), Government of India, Ministry of AYUSH, New Delhi.
2. Kokate, C. K., Purohit, A. P., & Gokhale, S. B. (2019). *Pharmacognosy.* Nirali Prakashan.

Principle

Asava and Arista are self-generated alcoholic preparations obtained by the fermentation of herbal decoctions or infusions. The alcohol present is volatile, and when distilled, it passes over with water vapor. The distillate is collected and its specific gravity is determined using a pycnometer or alcoholmeter. The corresponding alcohol percentage is then determined by reference to alcohol-water tables at 20°C.

Materials Required

- Distillation apparatus (round-bottom flask, condenser, receiver)
- Thermometer
- Measuring cylinder
- Pycnometer / Specific gravity bottle
- Alcoholmeter (if available)
- Water bath
- Beakers
- Pipettes

Chemicals and Reagents

- Distilled water
- Asava or Arista sample (e.g., *Drakshasava*, *Dashmoolarishta*)

Procedure

A. Distillation

1. Take 25 mL of the Asava/Arista sample in a distillation flask.
2. Add an equal volume of distilled water to prevent charring and bumping.
3. Set up the distillation apparatus and collect about 90–95% of the total volume of the distillate.
4. Cool the distillate to 20°C.

B. Determination of Specific Gravity

1. Weigh the empty pycnometer (W_1).
2. Fill it with distilled water at 20°C and weigh (W_2).
3. Empty and fill it with the distillate at 20°C and weigh again (W_3).
4. Calculate the specific gravity (S.G.) using the formula:

$$\text{Specific Gravity} = \frac{(W3 - W1)}{(W2 - W1)}$$

C. Determination of Alcohol Percentage

- Using the Alcohol Table (Alcoholometric table), find the percentage of alcohol corresponding to the specific gravity at 20°C.
- Express the result as % v/v alcohol in the sample.

Observation Table

S. No.	Sample	Weight of Empty Pycnometer (W_1)	Weight with Water (W_2)	Weight with Distillate (W_3)	Specific Gravity	% Alcohol (v/v)
1	Drakshasava	25.00 g	50.00 g	48.50 g	0.94	11.5%
2	Dashmoolarishta	25.00 g	50.00 g	48.75 g	0.95	10.0%

Sample Calculation

For *Drakshasava*:

$$\text{S.G.} = \frac{48.50-25.00}{50.00-25.00} = \frac{23.50}{25.00} = 0.94$$

From alcohol tables:

S.G. 0.94 at 20°C = 11.5% v/v alcohol.

Results

Sample Name	Alcohol Content (% v/v)	Pharmacopoeial Limit
Drakshasava	11.5%	5–12%
Dashmoolarishta	10.0%	5–10%

Both samples are within the permissible limit as per the *Ayurvedic Pharmacopoeia of India*.

Discussion

- The alcohol in Asava and Arista is self-generated by fermentation of sugars present in the herbal mixture.
- The distillation and specific gravity method provides a simple way to estimate alcohol content.
- The acceptable range for most Asava and Arista preparations is 5–12% v/v, depending on the formulation.
- Maintaining proper fermentation conditions is essential for consistent alcohol content and therapeutic efficacy.

Precautions

- Do not overheat the sample; distill at a controlled temperature.
- Ensure the distillate and water are both measured at the same temperature (preferably 20°C).
- Use clean and dry apparatus for accurate results.