

## DETERMINATION OF MOISTURE FROM CHILLIES AND CHILLI POWDER BY DEAN STALK APPARATUS METHOD.

P. Sridhara Babu<sup>1</sup>, K. Daniel<sup>2</sup> and M. Guravaiah<sup>3</sup>

<sup>1</sup>Department of Chemistry, J.K.C College, Guntur-6, Andhra Pradesh, India.

<sup>2</sup>Department of Zoology, J.K.C College, Guntur-6, Andhra Pradesh, India.

<sup>3</sup>Department of Biotechnology (P.G), J.K.C College, Guntur-6, Andhra Pradesh, India.

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### ABSTRACT:-

### KEYWORDS:-

### INTRODUCTION

Chilli (*Capsicum annum var. acuminatam* Linn) is the most abundantly consumed spice in the world and both green and ripe dry fruits are used in terms of quality. Spices constitute an important group of agricultural commodities, which since antiquity; have been considered indispensable in the culinary art for flavouring foods. Vegetables are highly perishable, seasonal and are available in plenty in a particular area and thus its post harvest processing is complex. It is estimated that

only 1.8% of vegetable production goes to food processing industries.

Moisture content is one of the most commonly measured properties of food materials. It is important to food scientists for a number of different reasons.

- *Legal and Labeling Requirements.* There are legal limits to the maximum or minimum amount of water that must be present in certain types of food.
- *Economic.* The cost of many foods depends on the amount of water they contain - water is an inexpensive ingredient, and manufacturers often try to incorporate as much as possible in a food, without exceeding some maximum legal requirement.
- *Microbial Stability.* The propensity of microorganisms to grow in foods depends on their water content. For this reason many foods are dried below some critical moisture content.
- *Food Quality.* The texture, taste, appearance and stability of foods depends on the amount of water they contain.

- *Food Processing Operations.* A knowledge of the moisture content is often necessary to predict the behavior of foods during processing, *e.g.* mixing, drying, flow through a pipe or packaging.

It is therefore important for food scientists to be able to reliably measure moisture contents. A number of analytical techniques have been developed for this purpose, which vary in their accuracy, cost, speed, sensitivity, specificity, ease of operation, *etc.* The choice of an analytical procedure for a particular application depends on the nature of the food being analyzed and the reason the information is needed.

**Purpose:** To determine the moisture content in black and white pepper by co-distillation with toluene.

### A. Apparatus

1. Distillation unit with ground glass joints constructed and assembled as shown in Fig.1 with.
  - a) 500 ml round bottom flask with a T.S. 24/29 joint
  - b) West condenser with drip tip, 400 mm in length with a T.S. 19/26 joint.
  - c) Dean and Stark Water estimation trap, TS 24/29 joint, 10 mL capacity graduated in 0.1 mL intervals.
2. Heat source capable of refluxing toluene in the above apparatus. An electric heating mantle with a variable power control or heating mantle supported by a variable speed stirring plate and egg shaped teflon covered stir bar can also be used. If not using string plate add boiling chips.
3. Nylon bristle brush, ½ inch in diameter or a wire loop, long enough to extend through the condenser (approx. 450 mm).
4. Analytical balance of sensitivity 0.01g

### B. Reagents

1. Toluene (Laboratory Reagent Grade)

### C. Preparation of Sample

1. Prepare sample as given in Method No.1.0

**D. Procedure**

1. Weigh aliquot of sample sufficient to yield 2-4 mL of water (about 40g).
2. Transfer sample quantitatively to distillation flask and add sufficient toluene to cover the sample completely and to middle of distillation flask. Add a stir bar or boiling chips.
3. Assemble the apparatus, and fill the trap with toluene by pouring through the condenser until it just fills the trap and begins to flow into the flask. Insert a loose non-absorbing cotton plug into the top of the condenser to prevent condensation of atmospheric moisture into the condenser.
4. Bring to boil and reflux at about 2 drops per second until most of the water has been collected in the trap, then increase the reflux rate to about 4 drops per second.
5. Continue refluxing until two consecutive readings 15 min. apart show no change. Turn off the heat and allow to cool to ambient temperature. Dislodge any water held up in the condenser with a brush or wire loop. Rinse the condenser carefully with about 5 mL toluene.
6. Read volume of water in the trap.

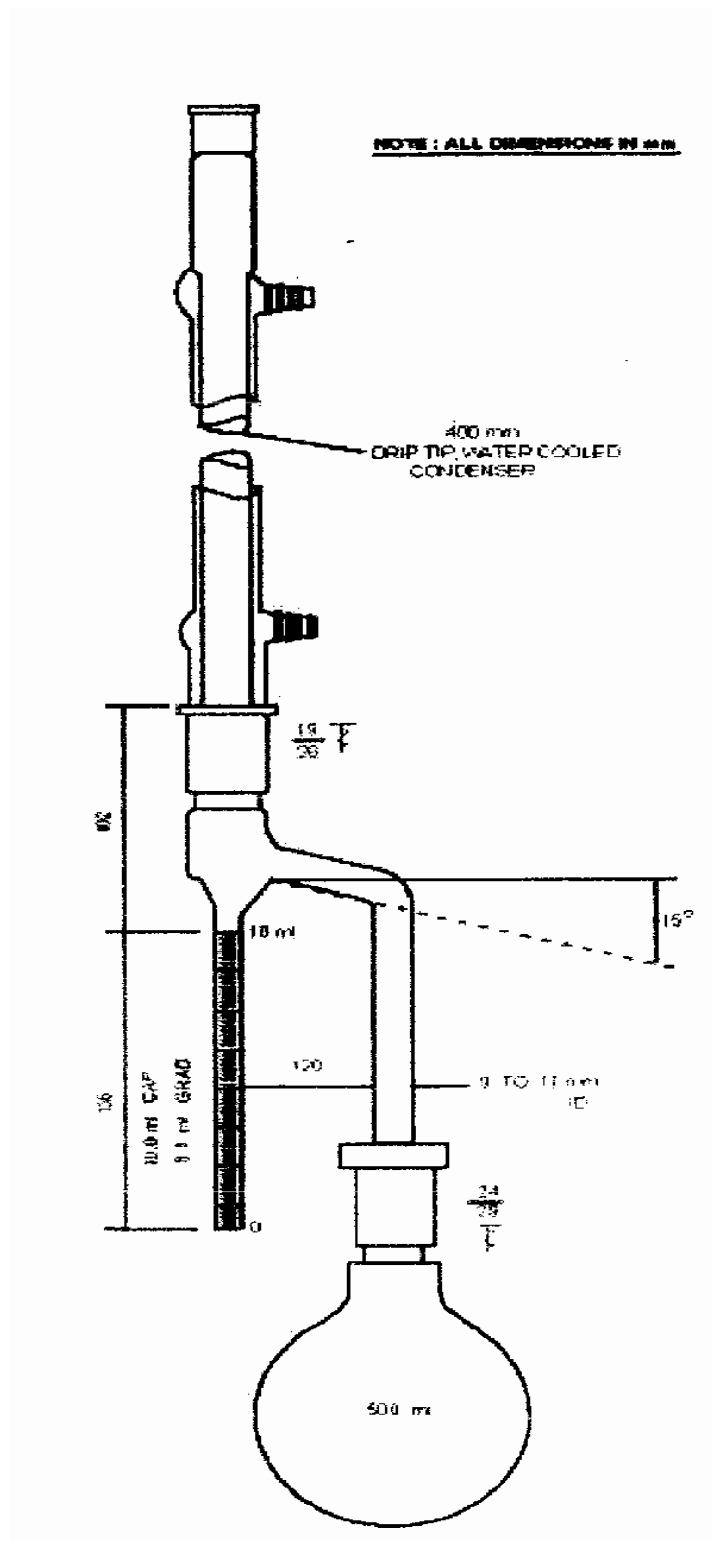
**E. Calculation**

1. Moisture, % =

$$\frac{\text{Vol. of water (mL)}}{\text{Correction factor}} \times \frac{100}{\text{Correction factor}}$$

2. Correction factor =  $\frac{\text{ML distilled}}{\text{ML added}}$

Weight of sample (g)



## REFERENCE

1. ASTA Method No.2.0, Official Analytical Methods of the American Spices Trade Association, Fourth Edition, 1997.
2. Official Methods of Analysis of AOAC International, 16<sup>th</sup> Edition, 1996.