

## Dehydration of *Costus speciosus* Koen ex. Retz.) Sm. Rhizome and its Qualitative Analysis for Selected Primary Metabolites

P. M. Dighe\*

\*Department of Physics,

Padmashri Vikhe Patil College of Arts, Science and Commerce, Pravaranagar- 413713

Email: pradeep.dighe@pravara.in

### ABSTRACT

*Costus speciosus* (Koen ex. Retz.) Sm. is an important medicinal herb used in production of Ayurvedic formulations. The plant is effective in health complaints like pneumonia, urinary tract diseases, jaundice, mental disorders and in diabetes. The plant material is supplied to the herbal pharmaceutical industries in form of raw material i.e. powder form. To obtain the powders, the plant material is to be dried to reduce its moisture content. Various drying techniques like Sun drying, Oven Drying and Shade Drying are been employed to dehydrate the plant material. In the present investigation, among these, shade drying technique was found to be most suitable as it showed less loss of primary metabolites that are supposed to have medicinal properties.

**Key words:** *Costus*, herb, health complaints, dried, metabolites.

Received 12.02.2017

Revised 20.04.2017

Accepted 01.04.2017

### Citation of this article

P. M. Dighe. Dehydration of *Costus speciosus* Koen ex. Retz.) Sm. Rhizome and its Qualitative Analysis for Selected Primary Metabolites. Int. Arch. App. Sci. Technol; Vol 8 [2] June 2017. 06-07.

### INTRODUCTION

*Costus speciosus* (Koen ex. Retz.) Sm. is an important medicinal herb used in solving various health complaints. The plant is antibacterial, antifungal, antioxidant, anti-inflammatory, analgesic, antipyretic, diuretic, larvicidal etc. The rhizomes are bitter, astringent, acrid and having cooling, aphrodisiac, purgative, anthelmintic, febrifuge, expectorant, tonic properties. It improves digestion and helps in cleaning toxic materials from body. It is also referred in diseases like pneumonia, rheumatism, urinary complaints, jaundice, diabetes and mental disorders.

The plant material is supplied to the herbal pharmaceutical industries in form of raw material i.e. powder form. Various drying techniques are been employed to dehydrate the plant material. In the present investigation, sun, oven and shade drying technique was employed to dehydrate the plant material and the powder was further used for qualitative analysis of primary metabolites like carbohydrates, proteins and lipids.

### MATERIALS AND METHODS

Rhizomes of *Costus speciosus* (Koen ex. Retz.) Sm. were collected from the Botanical garden of the college and brought to the laboratory for further investigations. They were thoroughly washed under running tap water to remove traces of soil and kept on the blotting paper for removing water. Then, the rhizomes were cut into small pieces and further used for dehydration. The rhizomes were dehydrated by using three different techniques viz. Shade drying, Sun Drying and Oven Drying. The pieces were placed on the blotting paper in shade and also directly under sunlight. The blotting paper under the pieces kept in shade was frequently changed so as to avoid fungal growth. Rhizome pieces filled in a glass vessels were kept in an Oven at 50°C temperature for a week.

Totally dehydrated pieces were than powdered with the help of a grinder. The powder was collected separately and stored in an air tight glass bottles. Further, the powder was used for qualitative analysis of carbohydrates, proteins and lipids using various qualitative tests as:

#### 1. Test for Carbohydrates:

Benedict's solution was used to test for carbohydrates. Benedict's solution is a blue colored liquid that contains copper ions. When Benedict's solution and simple carbohydrates are heated, the solution changes to orange red/ brick red. This reaction is caused by the reducing property of simple carbohydrates. The copper (II) ions in the Benedict's solution are reduced to Copper (I) ions, which causes the color change. Sometimes a brick red solid, copper oxide, precipitates out of the solution and collects at the bottom of the test tube.

### 2. Test for Lipids:

Grease spot test/Brown paper test was used to test for lipids. Two ml of methylene chloride is used to dissolve ~0.1 g of the sample to be tested. If solid material remains, grind it in a mortar and pestle and then filter to remove the solid from the test solution. If a liquid sample is insoluble, take the test solution from the methylene chloride layer. Several drops of the test solution are placed on a sheet of paper and the solvent allowed to evaporate. Lipids leave translucent spots (grease spots) on unglazed brown paper bags that indicate the positive test.

### 3. Test for Proteins:

Biuret test was used to test proteins. An aqueous sample was treated with an equal volume of 1% strong base (sodium or potassium hydroxide) followed by a few drops of aqueous copper (II) sulfate. If the solution turns purple, protein is present. Biuret solution is a blue liquid that changes to purple when proteins are present and to pink in the presence of short chains of polypeptides. The copper atom of the biuret solution reacts with the peptide bonds to cause the color change.

## RESULTS AND DISCUSSION

The powdered sample of rhizomes of *Costus speciosus* (Koen ex. Retz.) Sm. tested with various reagents mentioned above showed presence of carbohydrates, lipids and proteins as given below:

**Table1: Tests for Carbohydrate, Lipids and Proteins in Rhizome of *Costus speciosus***

Sr. No.	Test Plant	Test	Sample	Observation		
1.	<i>Costus speciosus</i> (Koen ex. Retz.) Sm. (Rhizome)	Carbohydrate (Benedict's Reagent)	Shade Dried	+++		
			Sun Dried	++		
			Oven Dried	+		
2.		Proteins (Biuret test)		Shade Dried	+++	
				Sun Dried	++	
				Oven Dried	+	
3.			Lipids (Grease Spot Test)		Shade Dried	+++
					Sun Dried	++
					Oven Dried	+

+++ : Excellent, ++ : Good, + : Weak

From the above data, it was clear that the shade dried sample showed more positive results for presence of proteins, lipids and carbohydrates as compared to the sun dried and oven dried samples. Result reveals that, as temperature is increased, the concentration of primary metabolites is decreased.

## CONCLUSION

*Costus speciosus* (Koen ex. Retz.) Sm. is an important medicinal plant used in manufacturing of ayurvedic formulations. Results indicate that the quality of primary metabolites decreases with increase in temperature. So, this may be same for the secondary metabolites present in the rhizome that are having medicinal properties. Therefore to maintain the quality of the drug, the plant material supplied to the pharmaceutical industry should be shade dried instead of sun and oven dried.

## REFERENCES

- Das Karabi, Partha Pratim Kalita, Manash Pratim Sarma, Nayan Talukdar, Parimita Kakoti, (2014). Extraction, estimation and comparison of proteins and carbohydrates from different parts of *Costus speciosus* and a brief study on its phytochemicals content, *Int. Jour. of Basic and Appl. Bio.*, **2 (2)**:81-85.
- Karthikeyan J., V. Deka and Raja V. Giftson. (2012). Characterization of bioactive compounds in *Costus speciosus*(Koen), by reverse phase HPLC. *JPSR*. **3 (5)**: 1461-1465.
- El-Far, A. H. and Abou-Ghanema, I. I. (2013). Biochemical and hematological evaluation of *Costus speciosus* as a dietary supplement to Egyptian buffaloes. *African Journal of Pharmacy and Pharmacology*. **7(42)**: 2774-2779.
- Pawar V. A., and P. R. Pawar. (2014). *Costus speciosus*: An Important Medicinal Plant. *International Journal of Science and Research*. **3(7)**: 28-33.