

**THE STABILITY OF PHYTOCHEMICAL COMPOUNDS IN MATURED  
TURMERIC LEAVES (*Curcuma domestica*), GALANGAL (*Alpinia galanga*) AND  
KANTAN FLOWER (*Etilingera elatior*) SUBJECT TO DIFFERENT DRYING  
TREATMENTS**



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## **ABSTRACT**

Phytochemicals are plant substances that protect our cells from free radicals and support proper function of enzyme systems. However, most of the phytochemical compounds are sensitive to light, heat and storage conditions. In this study, the turmeric leaves, galangal and kantan flower were dried until the moisture content approximately 10% to prevent microbial growth during storage. The main objective of this study is to determine the effect of sun drying, oven drying and freeze drying on ascorbic acid, total polyphenolic compounds and total carotenoids in these plants. Results obtained shows that ascorbic acid, total polyphenolic compounds and total carotenoids were sensitive to heat and oxidation during drying treatments. Freeze drying at  $-35^{\circ}\text{C}$  for 48 hours resulted in significantly ( $p < 0.05$ ) better retention of ascorbic acid and total polyphenolic compounds in turmeric leaves, galangal and kantan flower as compared to sun drying and oven drying. The exposure of herbal plants to direct sunshine leads to significant destruction of ascorbic acid, total polyphenols and carotenoids. Oven drying ( $50^{\circ}\text{C}$ ) is the best alternative to freeze-drying in order to retain the maximum amount of ascorbic acid, total polyphenol and carotene in turmeric leaves, galangal and kantan flower.

## **1.0 INTRODUCTION**

### **1.1 Background**

Fresh turmeric (*Curcuma domestica*) leaves, galangal (*Alpinia galanga*) and 'kantan' flower (*Etingera elatior*) are widely distributed in tropical and subtropical regions especially in India, Thailand, China, Indonesia, Jamaica, Haiti and other tropical countries.

These herbs are eaten as tonic for stomach and heart. Both rhizomes and leaves are used for strengthening the urinary tract and for treating urinary tract infections. In alternative medicine, turmeric is said to be a tonic for the liver, help to calm inflammation and to relieve digestive problems. Turmeric improves circulation. Apart it was found that turmeric also contains antioxidant compound, anti-fungal and anti-bacterial properties (George, 1994). Galangal also holds a place of honor in today's scientific world. Besides aiding digestion and relieving gastric distress, it is useful in alleviating the dizziness and nausea associated with morning sickness as well as motion sickness. 'Kantan' flower can also be use to treat indigestion. In addition, it has been demonstrated that fresh or well-processed plant-derived foods (Mainly fruits, vegetables and cereals) are the best sources of antioxidant vitamins (Daood et al., 1996). These herbs also have been widely used as condiments in food due to its unique taste and smell. It becomes part of the ingredients in Malay cooking (Muhammad & Mustafa, 1994).