

## CHAPTER 1

### INTRODUCTION

#### 1.1 Principles, rationale and hypothesis

The longan (*Dimocarpus longan* Lour.) is an attractive subtropical fruit, grown commercially in many countries, including Thailand, China, India and Vietnam (Jiang *et al.*, 2002). The Most of cultivating areas were in the northern part of Thailand such as Chiang Mai, Chiang Rai, and Lamphun provinces. Thailand has exported fresh longan to Hong Kong, Indonesia, Singapore, China, Malaysia and Canada while dried longan has been exported to China. Longan fruit is non-climacteric with sweet, crisp and juicy with a unique musky flavour (James, 2004). Harvest is judged by eating quality and size. The shelf-life under ambient conditions is only 3-4 days (Tongdee, 1992). It is difficult to store longan in any good condition (appearance and taste), because fruit pericarp become discolour (yellow and dark brown) easily from disease, dehydration or chilling injury. Fruit should be stored under high humidity and relative temperature to avoid dehydration and chilling injury. Sulphur dioxide (SO<sub>2</sub>) fumigation is the most widely used to successfully maintain quality of longan fruit. While sulphites are unique compounds because they can perform many functions in food, SO<sub>2</sub> can control both enzymatic and non-enzymatic browning, and functions as antimicrobial agents and control the growth of microorganisms in food, and also act as bleaching agents, antioxidants and reducing agents (Chang and Whitaker, 1995). As a result, SO<sub>2</sub> is responsible for controlling postharvest browning and prolonging shelf life of fresh produce. However, there is no

study on ultrastructure and chemical components of longan fruit changes under sulphur dioxide fumigation and store at low temperature during transportation to abroad. So, study on SO<sub>2</sub> treating responded on anatomical and biochemical changes in longan fruit pericarp stored at low temperature were needed to be investigated.

### **1.2 Research objectives**

To study the effect of sulphur dioxide on anatomical and biochemical changes in longan fruit during storage at low temperature.

### **1.3 Research scope**

- Uses of stereomicroscope to study the anatomical characteristics of normal and sulphur dioxide treated on longan pericarps
- Analysis of physical and chemical components of normal and sulphur dioxide treated on longan pericarps during storage.

### **1.4 Usefulness of the research**

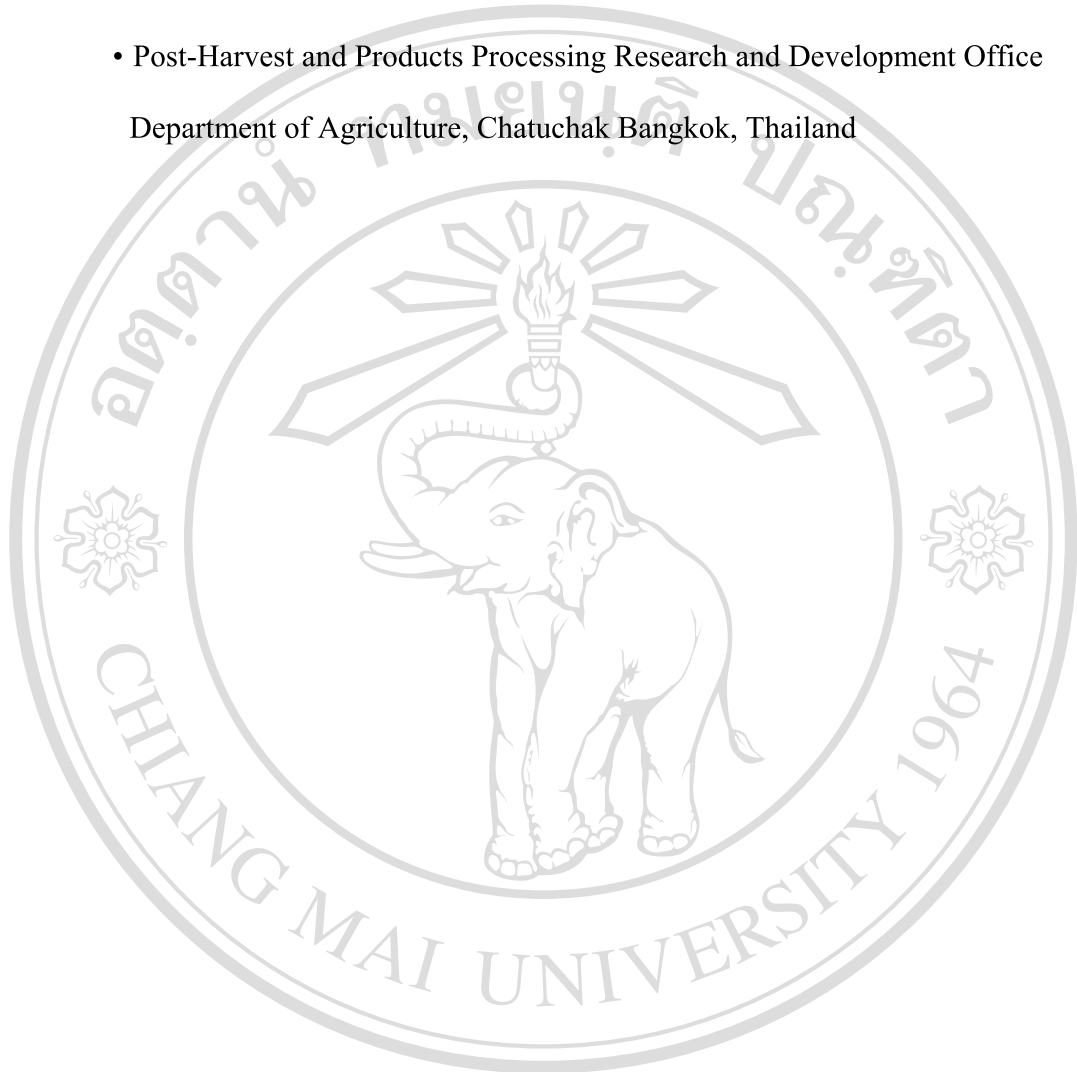
This research will help to clarify the relationship between ultrastructure of longan pericarp, sulphur dioxide residue, enzyme activities and phenolic compounds under sulphur dioxide treated condition. Furthermore, this study should be helpful in developing method to control the quality for export of longan fruit.

### **1.5 Research locations**

- Postharvest Technology Research Institute, Chiang Mai University, Chiang Mai

50200, Thailand.

- Post-Harvest and Products Processing Research and Development Office  
Department of Agriculture, Chatuchak Bangkok, Thailand



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