

## CHAPTER 1

### INTRODUCTION

#### 1.1. Rationale

Longan fruit (*Dimocarpus longan* Lour.) is a non-climacteric subtropical fruit, and it is one of the most valuable fruits in Vietnam for domestic and export markets because of which has delicious taste and excellent nutritional properties. In Vietnam, the production area of longan is around 122,000 ha, among them 95,000 ha is harvesting with the yield of 610,000 tons per year. Provinces with the high productivity of longan fruit are Tien Giang (114,000 tons), Ben Tre (110,000 tons), Vinh Long (100,000 tons) (The Electric Newspaper of Communist Party of Vietnam, 2009), Hung Yen province produced 40,745 tons in 2008 (Hung Yen Department of Statistics, 2008). There are several varieties of longan available in the domestic markets, 'Long' is one of the popular variety and its total production ranks in the first among commercial longan. Fruit development from fruit set to maturity takes 20 to 28 weeks, varying with seasons, regions and cultivars (Tongdee, 2001). In an average year the harvesting season starts in middle of July and within 30-45 days is in full swing, lasting through to September. The fruits have very short postharvest life of 3-4 days under ambient temperatures (Tongdee, 2001). The storage of 'Long' longan fruit after harvesting is a very important step for controlling price, especially in off season. It is also very useful in the long distance of exportation to foreign markets. However, the storage time and selling period can affect fruit quality. The main factors reduce the storage life and marketability of 'Long' longan fruit are pericarp browning, fungal

and microbial decay. The postharvest quality of longan fruit should be controlled to fulfil the demand of consumers.

Therefore, the aim of this research is to study on effects of sodium metabisulfite ( $\text{Na}_2\text{S}_2\text{O}_5$ ) on postharvest quality and storage life of longan fruit to obtain an optimal treatment for preservation of 'Long' longan fruit in Vietnam.

## **1.2. Principles, Theory and/or Hypothesis**

### 1.2.1 Principles/Theory

Longan is considered as a traditional fruit of Vietnam with the main production areas being in the southern provinces: Tien Giang, Ben Tre, Dong Thap, Vinh Long, Can Tho, Baria Vungtau; and in the northern provinces: Lao Cai, Yen Bai, Thai Nguyen, Phu Tho, Son La, Hung Yen and Thanh Hoa (FAO, 2004). 'Nhan' is a local term for longan in Vietnam. The most popular cultivar in the North is 'Long' longan which produces large fruits with small seeds (about 80 to 100 fruits/kg) (FAO, 2004). In recent years, there have been increasing significantly the yield and the cultivated area of 'Long' longan in the northern Vietnam. It has not only high quality but also high economic value (Nguyen *et al.*, 2001). The fruit is harvested only when it is mature and has attained acceptable eating qualities. However, longan fruits have very short postharvest life of 3-4 days under ambient temperatures (Tongdee, 2001). The postharvest 'Long' longan rapidly deteriorates without any appropriate postharvest treatments, and deterioration is mainly characterized by brown skin, fungus, rot, moisture loss and alterations in flavor. There were some studies on preservation of flesh 'Long' longan fruit in Vietnam such as: sulfur dioxide fumigation (Nguyen *et al.*, 2001); dipping in benlate solution (Tran, 1999);

chitosan coating (Nguyen *et al.*, 2001). All of the results showed that ‘Long’ longan fruit shelf life was limited by a visual appearance (the color changed in to dark brown); a reduction of sensory values; the development of disease, fungus, and the percentage of fruit decay was about 10-20%.

At present in Vietnam, the recommended method to control postharvest decay and prevent pericarp browning of ‘Long’ longan fruits have been using treatment of dipping the fruits in 0.2% carbendazim solution for 3 minutes, treated fruits were packaged in LDPE bag, and then storing them at 10°C. The results showed that the ‘Long’ longan fruit can be prolonged shelf life with good quality for 20 days, and the percentage of fruit decay was about 10% (Nguyen *et al.*, 2001). Longan consumers are becoming cautious regarding carbendazim residues, due to it is a type of pesticide. It harms to the health of humans, so it should be used in planting. There is a need to develop effective methods to replace carbendazim treatment, with something less harmful to humans and the environment. An alternative method is the use of sodium metabisulfite.

### 1.2.2 Hypothesis

‘Long’ longan fruit can be prolonged the storage life more than 20 days, and prevent or reduce the fruit decay under 10% with good qualities; prevent pericarp browning; by using sodium metabisulfite treatment in combination with low temperature.

### 1.3. Purposes of the Study

To study on effects of sodium metabisulfite on postharvest quality and storage life of Vietnamese longan fruit cv. Long.

#### **1.4. Education/Application Advantages**

In Vietnam, the study on storage of 'Long' longan still has many problems. While people cannot apply the modern methods in combine with modern equipments to store longan because of economic ability (Nguyen *et al.*, 2001).

Results from this research will help to understand the interaction between sodium metabisulfite and low temperature during the time of postharvest storage. Furthermore, results from this research will help Vietnamese people not only to handle a new technology on preservation of 'Long' longan fruit but also have benefits by controlling price at the peak of harvesting period and extending storage life.

#### **1.5. Research Location**

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