

ABSTRACT

RESPIRATION PATTERN AND FRUIT QUALITY CHANGES OF BANANA (*Musa paradisiaca* L.) cv. 'MULI' IN PASSIVE PACKAGING TECHNIQUE AT VARIOUS PACKAGE VOLUMES AND CHITOSAN CONCENTRATIONS

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'Muli' banana belongs to climacteric fruit that shows a respiration burst during fruit ripening. The fruit has a short shelf life which is characterized by formation of abscission layer at fruit base and blackening of its skin. The short shelf life may be due to high respiration rate and fast metabolic changes inside the fruit. Modified atmosphere packaging (MAP) is one post harvest techniques for storing fruit. This method is commonly done by reducing O₂ concentration and increasing CO₂ concentration surround the fruit. Other post harvest handling may be conducted by wrapping the fruit. Chitosan can be used as fruit coating to slow or reduce O₂ diffusion into the fruit and prevent CO₂ efflux from the fruit. The purposes of this research were to study the differences in the pattern and rate of respiration and changes in fruit quality of 'Muli' banana at various packaging volumes; to study the differences in the pattern and rate of respiration and changes the quality of 'Muli' bananas at various concentrations of chitosan; and to study the differences in the pattern and respiration rate and changes in fruit

quality of 'Muli' banana on a combination of various packaging volume and chitosan concentration.

This research was conducted in the Laboratory of Horticulture, Faculty of Agriculture, Lampung University from October- November 2009. Treatments were arranged in a completely randomized design, and laid out factorially 4 x 4. The first factor was passive packaging with 4 sizes of container in a volume of 2.3, 3.0, 4.0 and 5.0 l. The second factor was 4 concentrations of chitosan, *i.e.* 0, 2.5, 4.0, and 5.5%. Observations were done for the following parameters: respiration rate, fruit weight, total soluble solid, free acid content, and fruit firmness.

The results showed that:(1) the pattern of respiration in 'Muli' banana fruits on a variety of packaging volume was not much different, indicating a decrease in respiration during 3-10 day of storage, while the respiration rate was slightly different. Respiration rate of 'Muli' bananas on the packaging of 3 l was lower than other containers (1.5, 4.0 and 5.0 l), the value was 43.13 mg CO₂/kg/hour, (2) The pattern of respiration in 'Muli' banana fruits at various concentrations of chitosan was not much different and showed the pattern of decrease in respiration. Respiration rate of 'Muli' bananas at chitosan concentration 2.5% was lower than with chitosan concentrations of 0, 4.0 and 5.5%, the value was 50 mg CO₂/kg/hour, (3) The respiration pattern on the combination of various concentrations of chitosan and the volume of packaging on 'Muli' bananas was also similar. The respiration rate also decreased in 3-11 days of storage. The declining rate was low at 3 l containers with a combination of chitosan (0-4.0%), which was about 50 mg CO₂/kg/hour; (4) Changes in weight loss, soluble solid

content and free acidity and fruit firmness of 'Muli' bananas were not different at various packaging volumes or concentrations of chitosan and their combinations.

Keywords: banana, passive packaging, chitosan, respiration and fruit quality