

ABSTRACT

EFFECTS OF FRUIT MATURITIES, COATINGS, AND STORAGE TEMPERATURES ON THE QUALITIES AND SHELF-LIFE OF CAVENDISH BANANA

By

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Cavendish banana is a climacteric fruit with a fast response to ethylene and a very high respiration rate during storage. Previous studies revealed that these characteristics shortened the green-life and fastened fruit damage, affecting the economic value. Therefore, this study aims to examine the effects of fruit maturity levels, coatings, and storage temperatures on the qualities and green-life of Cavendish banana. This study used a Completely Randomized Design with a factorial 3 x 4 x 2 with 3 replications. The first factor was the banana fruit at 3 levels of maturities, namely physiologically immature M1 (5th cluster), full mature M2 (3rd cluster), and over mature M3 (1st cluster). The second factor was the fruit coating, namely non-coating or control (C1), 1% chitosan (C2), 150 ppm GA₃ (C3), and 1% chitosan + 150 ppm GA₃ (C4), which were applied on the rind tip and base. The third factor was the storage temperature, including room S1 (27 ± 1°C) and cold S2 (16 ± 1°C) temperatures. The observation was discontinued in this study either when the fruit rind changed to stage III (greenish yellow) at the end of the green shelf-life, or flesh was softened or past 35 days in the postharvest handling. The result showed that the level of fruit maturity significantly increased the green-life duration, as well as maintained firmness, diameter loss, acidity, and starch content, but it had no effect on weight loss, °brix, and glucose. The use of 1% chitosan, 150 ppm GA₃, or their combination had no significant effect on all parameters. Meanwhile, low temperature was able to delay senescence, promote starch degradation, as well as detain firmness and diameter loss. The results also showed that the combined application of maturity levels and storage temperature affected all parameters, while maturities + coatings as well as coatings + storage had effects on firmness, acidity, and starch content. The 1% chitosan coating coverage was analyzed with a Scanning Electron Microscope (SEM), which showed fully covered surface of M1 finger rind tip and some crack points on finger rind base. Furthermore, there was full coverage on M2, and some crack points on M3.

Keywords : Cavendish banana; maturity; coating; storage; temperature

ABSTRAK

PENGARUH KEMATANGAN BUAH, PELAPISAN, DAN SUHU PENYIMPANAN TERHADAP KUALITAS DAN MASA SIMPAH PISANG CAVENDISH

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Pisang Cavendish merupakan buah klimakterik dengan respon yang cepat terhadap etilen dan laju respirasi yang sangat tinggi selama penyimpanan. Studi sebelumnya mengungkapkan bahwa karakteristik ini memperpendek masa simpan hijau dan mempercepat kerusakan buah, yang mempengaruhi nilai ekonomi. Oleh karena itu, penelitian ini bertujuan untuk mengkaji pengaruh tingkat kematangan buah, pelapisan, dan suhu penyimpanan terhadap kualitas dan masa simpan hijau pisang Cavendish. Penelitian ini menggunakan Rancangan Acak Lengkap faktorial $3 \times 4 \times 2$ dengan 3 kali ulangan. Faktor pertama adalah buah pisang pada 3 tingkat kematangan, yaitu M1 belum matang fisiologis (sisir ke-5), M2 matang penuh (sisir ke-3), dan M3 lewat matang (sisir ke-1). Faktor kedua adalah pelapisan buah yaitu non pelapis atau kontrol (C1), 1% kitosan (C2), 150 ppm GA₃ (C3), dan 1% kitosan + 150 ppm GA₃ (C4) yang diaplikasikan pada kulit buah. ujung dan dasar. Faktor ketiga adalah suhu penyimpanan yang meliputi suhu ruangan S1 ($27 \pm 1^\circ\text{C}$) dan suhu rendah S2 ($16 \pm 1^\circ\text{C}$). Pengamatan dihentikan pada penelitian ini baik pada saat kulit buah berubah menjadi stadium III (kuning kehijauan) pada akhir masa simpan hijau, atau daging telah lunak atau melewati 35 hari pada penanganan pascapanen. Hasil penelitian menunjukkan bahwa tingkat kematangan buah secara nyata meningkatkan masa simpan hijau, serta mempertahankan kekerasan, susut diameter, asam bebas, dan kandungan pati, namun tidak berpengaruh terhadap susut bobot, °Brix, dan glukosa. Sementara itu, suhu rendah mampu menunda pemasakan, mendorong degradasi pati, serta mempertahankan kekerasan buah dan susut diameter. Hasil penelitian juga menunjukkan bahwa aplikasi kombinasi tingkat kematangan + suhu berpengaruh terhadap semua parameter, sedangkan kematangan + pelapisan serta pelapisan + penyimpanan berpengaruh terhadap kekerasan, asam bebas, dan kandungan pati. Cakupan lapisan kitosan 1% yang dianalisis dengan Scanning Electron Microscope (SEM), menunjukkan permukaan ujung kulit buah M1 tertutup penuh dan beberapa titik retakan pada permukaan pangkal buah. Selain itu, buah M2 terlapis penuh dan beberapa titik retak di M3.

Kata Kunci : Pisang Cavendish; kematangan; pelapisan; penyimpanan; suhu