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Abstract

Effects of LED Light Irradiation on Ripening and Nutritional Quality of '*Puwalu*' Banana (*Musa* sp.) during Postharvest Storage †

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Bananas (*Musa* sp.) are a vital source of food in many tropical countries, and this study focused on a local banana variety known as 'Puwalu' and explored how different types of light, specifically light-emitting diodes (LEDs), could affect the ripening and nutritional quality of mature green bananas during an 8-day postharvest storage period. We used LEDs to study how different light (blue, 464–474 nm, and red, 617–627 nm) affects postharvest banana characteristics. We compared the results with bananas that were not exposed to any additional light (the control group). We used statistical methods such as a complete randomized block design, *t*-tests, and one-way ANOVA with SAS 9.1 software to analyze the data. When we looked at the total soluble solid content, we observed significantly higher values in the blue light treatment group compared to the red light treatment and control groups. Similar trends were seen in measurements of CO_2 emissions and antioxidant activity (FRAP and DPPH assays). Regarding fruit firmness, both the blue and red light treatments resulted in significantly softer bananas compared to the non-illuminated control, with no significant difference between the blue and red treatments. The total polyphenolics content followed a similar pattern. When we assessed the peel color of 'Puwalu' bananas, we found significant differences, with the control group having the highest hue values, followed by the red light treatment, and the blue light treatment showing the lowest values. This research advances our knowledge of using LED lighting to improve banana postharvest management, thereby increasing their market appeal and nutritional content, with the most significant impact observed in the blue light treatment, followed by the red light treatment, as compared to the non-illuminated control group.

Supplementary Materials: The presentation materials can be downloaded at: https://www.mdpi.com/article/10.3390/proceedings2024105017/s1.

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