

EFFECT OF DIFFERENT WAVELENGTHS OF LIGHT EMITTING DIODES ON HARVESTED WATER SPINACH (*Ipomoea aquatica* Forsk.)

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Light emitting diode (LED) technology is explored as a potential solution to extend the shelf life and maintaining the quality of leafy vegetables. Water spinach (*Ipomoea aquatica* Forsk.) is a widely consumed leafy vegetable in many parts of the world. This study aims to investigate the effect of different wavelengths of LEDs on harvested water spinach. Accordingly, red ($1.69 \pm 0.07 \text{ Wm}^{-2}$), blue ($2.83 \pm 0.05 \text{ Wm}^{-2}$), and green ($2.02 \pm 0.09 \text{ Wm}^{-2}$) LEDs were selected. Harvested water spinach leaves were stored in a storage chamber under LEDs emitting different colours at 15°C and 80% relative humidity for four days. The experiments under ambient conditions and without LED (control) were conducted. Weight reduction, chlorophyll degradation, and leaf colour of the water spinach were recorded. The weight reduction of the leaves was $83.03 \pm 0.11\%$, $76.05 \pm 2.08\%$, $80.28 \pm 0.86\%$, $80.86 \pm 1.36\%$, and $88.19 \pm 0.71\%$ for red, blue, green, control, and ambient conditions, respectively. The corresponding chlorophyll change percentages were $33.52 \pm 0.72\%$, $51.79 \pm 3.84\%$, $32.84 \pm 5.89\%$, $9.10 \pm 1.47\%$, and $4.81 \pm 1.66\%$. The corresponding yellowness (b^*) values were 30.43 ± 0.94 , 26.79 ± 0.78 , 31.2 ± 0.78 , 35.62 ± 0.35 , and 35.93 ± 0.33 . According to the results, irradiation with blue LEDs showed significantly the lowest ($p < 0.05$) weight reduction compared to other conditions. Blue LEDs significantly ($p < 0.05$) delayed the chlorophyll degradation of the leaves and influenced b^* values and ΔE . In conclusion, the senescence and yellowing of water spinach could be effectively delayed by continuous exposure to blue LED light. Therefore, LED lighting would be useful to maintain and improve the postharvest quality of water spinach.

Keywords: Chlorophyll, Illumination, Irradiation, LED, Postharvest