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Changes of leaf morphology and growth of *Spinacia oleracea* grown under different light-emitting diodes

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This study aimed to determinate effects of light-emitting diodes on growth, leaf morphology and cellular structure of two cultivars (World-star and Sushiro) of *Spinacia oleracea*. Plants were grown in a NFT system for 25 Days After Transplanting (DAT) under the LEDs (White (W), Red and Blue (RB, ratio 2:1), Blue (B), Red (R) LED) under the same light intensity and photoperiod (130 $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$, 12 hours). Higher fresh and dry leaf weights, leaf number and leaf area were observed in the World-star cultivar than Sushiro. A 35% increase in leaf dry weight of World star was found under both the RB and R LEDs than the B and W LEDs at 25 DAT. In the Sushiro cultivar, the leaf dry and fresh weights were higher under the RB followed by R 25 DAT. Leaf apinasty symptom was appeared in plants grown under both R and RB LEDs with much more severe degree of symptom under the R than RB LED. Microscope analysis indicated that the cell elongation of center region (Adaxial) of leaf blade under the RB was much longer than the R LED. The photosynthetic activity was lower in the leaves grown under the R LED. All the integrated results suggest that it is necessary to determine proper ratio of R and B LEDs for a closed cultivation of *Spinacia oleracea* since the B LED is a light compensating the leaf apinasty symptom caused under the R LED. Also, Worldstar variety is more suitable for a closed cultivation with LED light sources.

Biography

Eunyoung Choi has completed her MSc from the University of Seoul, South Korea and Ph D from the University of Adelaide, Australia. She is Assistant Professor in the Department of Horticulture, Korea National Open University, Korea.

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