
Effect of light intensity in indoor cultivation of sweet basil (*Ocimum basilicum* L.)

Rathnayake R.R.M.U.N.B, Hemamali K.K.G.U.*

Department of Botany, Faculty of Science, University of Ruhuna, Matara, Sri Lanka.

The present study investigated the effects of different light intensities on the growth and the morphological characteristics of sweet basil (*Ocimum basilicum*), a medicinal herb used in the flavoring and pharmaceutical industries. The experiment was carried out in a completely randomized design with three replicates: including thirty plants in each replicate, under normal greenhouse conditions. Plants were cultivated at different light intensities using 50, 150 and 250 $\mu\text{molm}^{-2}\text{s}^{-1}$ photosynthetic photon flux density (PPFD) levels. The PPFD level was maintained by adjusting the distance to the top of the plants relative to the light source. Light treatments were introduced after one week of germination. A photoperiod of 10h was used for the treatments. Control group plants were grown under greenhouse conditions with average light intensity $68\mu\text{molm}^{-2}\text{s}^{-1}$, daily mean temperature at 27°C and 60% relative humidity. Plant height, internode length, leaf area, and fresh green mass were measured. All data were statistically analyzed using One way ANOVA and Tukey multiple comparison tests ($P<0.05$). Statistical analysis showed that the growth and morphological responses were significantly different among different light intensities. Plants cultivated at $250\mu\text{molm}^{-2}\text{s}^{-1}$ intensity treatment showed the highest plant height (46.9cm), internode length (11.4cm), leaf area (72.6cm^2), and fresh green mass (119.7g). Control group plants showed the lowest plant height (22.2cm), internode length (5.1cm), leaf area (9.1cm^2), and fresh green mass (38.1g). The results demonstrate that high light intensity levels are suitable for enhancing the growth and morphogenesis of sweet basil compared to lower light intensity levels. Thus, the application of high-intensity artificial light sources will promote the cultivation of sweet basil. Future studies on this line of research will warrant improving productivity.

Keywords: Light intensity, Morphology, *Ocimum basilicum*, Photosynthetic photon flux density

*Corresponding author: upeksha@bot.ruh.ac.lk