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RESEARCH ARTICLE

Influence of light emitting diodes as alternative lighting for cabbage (*Brassica oleracea* var. *capitata*) microgreens grown under ambient conditions

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Abstract

Artificial lighting is essential in indoor farming, wherein light quality is considered in crop production. In this study, light-emitting diodes (LEDs) using different colours (red (R), blue (B), RB and white (as control) were used to determine the impact on the growth of cabbage microgreens under ambient conditions. A completely randomised design with 4 replications was used. Microgreens were exposed to LEDs for 10 hr and 14 hr in darkness. The microgreens were harvested 10 days after emergence by cutting them from the surface of vermicast (as the substrate) using a sterilised pair of scissors. Results showed that white LED had shorter microgreens and hypocotyls than the other LEDs. Whereas the leaves were longer by exposing the microgreens to blue and RB LEDs than the white LED, the former LEDs showed a similarity with the red LED. A high root count was observed in microgreens with blue and RB LEDs, which was higher than red LEDs. But the white LED showed a similar root count to the other LEDs. Moreover, white LED produced a higher chlorophyll content based on its high SPAD index. Red and RB LEDs produced a higher fresh weight of microgreens than white LEDs. Fresh weight per microgreen had a positive relationship with the fresh weight yield of microgreens. Likewise, microgreen height, hypocotyl length and leaf length displayed a positive and significant association with a high yield of cabbage microgreens. Either red or RB LED is recommended to obtain a higher yield of microgreens for ambient indoor growing conditions.

Keywords: ambient growing of microgreens; fresh weight; functional food; longer and taller microgreens; RB light

Introduction

Microgreens are among the plants that are well-suited for cultivation with LEDs, given their nature for indoor cultivation, which makes them a good component for this type of production. These are tiny, edible and young plants considered a superfood due to their nutritional composition. Harvesting is usually between 7 and 21 days after sowing, with a height of 3 to 10 cm and only the shoot system is harvested with or without the true leaves (1). The phytochemicals and minerals are dependent on the species, light quality, substrates and other cultivation systems and postharvest interventions. But generally, microgreens are naturally rich in carotenoids, phenolic acids, flavonoids, tocopherols and ascorbic acid (1, 2). Microgreens are also good sources of minerals such as phosphorus, potassium, magnesium, manganese, copper, zinc, calcium and iron, but the composition is species-dependent (3). However, the growth of microgreens is affected by complex factors, including light quality.

LEDs are an essential tool for the cultivation of crops, including microgreens, as an alternative source of light, particularly for indoor and urban farming. Light is a driving factor in the growth and development of crops that provides energy for photosynthesis (4). Plants comprise photoreceptors (phytochromes, cryptochromes and phototropins) that stimulate or inhibit the growth and metabolism (5). Just like microgreens that can be grown under indoor and urban farming, the utilisation of applicable LED is vital. Microgreens are natural sources of minerals and rich in antioxidant properties, wherein harvesting can be done between 7 and 21 days from sowing, but it depends on the species and whether the true leaves have emerged or not.

Blue and red light-mediated elongation in plants is due to the presence of cryptochromes and phytochromes, respectively (6). The elongation is along with the activities of GA_{20}-oxidase and gene expression under blue light (7). Furthermore, blue and red provide energy for photosynthesis and photoreceptors that regulate morphogenetic events (plant elongation, flowering, stomatal opening and leaf expansion (4). It was reported that red LEDs potentially increase plant yield and vitamin C content (8). Moreover, red light contributed to elongation, resulting in taller plants (9, 10). Red light contributed a higher biomass than blue light, wherein the latter exhibited a higher amount of Rubisco along with reduced biomass (11). These effects might have a different impact on the cabbage microgreens; hence, the study was conducted to determine the impact of LEDs on the growth of cabbage microgreens under ambient conditions.

Materials and Methods

Seed material preparation

The seeds of cabbage using the Green Gold F_1 variety were purchased online and are available in the country. Distilled water was used to soak the seeds for 5 hr and 30 min. After which, the seeds were sterilised for 30 min using sodium hypochlorite (1 %, v/v). The seeds were washed 3 times with distilled water before air drying. Microgreen trays (32 cm × 24 cm × 4.5 cm: L × W × H) with vermicast as substrate were used to sow the seeds. The vermicast used contains 5.41 % total nitrogen, 564.92 ppm available phosphorus, 30.30 cmol/kg exchangeable potassium and 6.25 pH.

Growing conditions

The growing conditions used for cabbage microgreens were ambient temperature: 30 ± 2 ˚C and relative humidity: 65 ± 5 %. The distance between the LEDs and microgreens was 30 cm. The microgreens were exposed to 10 hr of light and 14 hr without light.

Harvesting

At 10 DAE, the microgreens with true leaves were harvested from the surface of the substrate using a sterilized pair of scissors.

Microgreen height, hypocotyl length and leaf length

Thirty microgreens were used to measure the height from above the surface of the substrate up to the tip of the leaf using a ruler. The hypocotyl length was measured from above the substrate to the attachment of leaves using a ruler. The difference between microgreen height and hypocotyl length was computed for the leaf length. Measurements were done at 2 - 10 DAE with 2 days interval.

Root length and root count per microgreen

At 10 DAE, a ruler was used to measure the root length from the point of attachment to the tip of the longest root. Root count per microgreen was counted at 10 DAE.

Chlorophyll content

A chlorophyll meter was used to measure the chlorophyll of the cabbage microgreens. Measurement was done 10 DAE or during the harvesting of microgreens.

Fresh weight of microgreens

Harvested microgreens were weighed using a digital weighing scale. Fresh weight per microgreen and fresh weight yield were recorded at harvesting.

Total soluble solids

At the harvesting stage (10 DAE), a digital refractometer was used to measure the total soluble solids of the microgreens.

Dry matter

The microgreens were oven-dried for 48 hr at 70 °C (12).

Statistical analysis

All data gathered were analysed using the analysis of variance for a completely randomised design replicated 4 times. The least significant difference test was used to determine the treatment means differences STAR program, developed by the International Rice Research Institute, was used to analyse the data.

Results and Discussion

Microgreen height

The microgreen height of cabbage was significantly affected by LEDs (Table 1). Results showed that in all observation periods, the microgreen height displayed a significant variation among LEDs. At 2-6 DAE, LEDs such as blue, red and RB consistently produced taller microgreens, which were taller than white LEDs. However, at the 8th DAE, taller microgreens were observed in blue LED, while white LED had the shortest microgreens. Additionally, at the harvesting stage, which is the 10 DAE, white LED consistently produced shorter microgreens. Results indicate that blue, red and RB induced the elongation of the cabbage microgreens, resulting in taller stature of cabbage microgreens. Previous studies reported the same observation that red light contributed to elongation, resulting in taller plants (9, 10, 13). It suggests that to obtain a higher microgreen height, growers have the option to choose from blue, red and RB, depending on the available LED.

Elongation is light-mediated by blue light through cryptochromes, which concurred with the results that microgreens grown under blue LED produced taller stature than white LED (6). Cryptochromes are blue light receptors that mediate the elongation (14). However, the exposure duration must be considered to avoid the decrease in elongation (15). Other studies reported that red light contributed to stem elongation and the exposure period is considered because a longer contact with this light has higher efficiency (16-18). This indicates that the exposure of microgreens to blue LED is still beneficial; however, a study on the exposure period of microgreens to different LEDs is recommended.

Hypocotyl length

A significant variation in the hypocotyl length among LEDs was observed (Table 2). Early stage, particularly at 2 DAE, RB and blue LEDs displayed a similarity in hypocotyl length, but the former had longer hypocotyls than red and white LEDs. However, as the microgreens matured from 4-10 DAE, blue LEDs displayed a competitive hypocotyl length, which was longer than white LEDs. Although the former LED showed a similar hypocotyl length to red and RB at 10 DAE. In addition, white LED consistently exhibited the shortest hypocotyls among the LEDs. The increase in the hypocotyl length is due to the stimulation effect of red and blue LEDs, which was also reported by previous studies (9, 10, 13).

Table 1. The height of cabbage microgreens as affected by LEDs at different observation periods

LEDs	Microgreen height (cm)				
	2 DAE	4 DAE	6 DAE	8 DAE	10 DAE
Blue (B)	1.99 a	5.64 a	8.33 a	10.48 a	11.14 a
Red (R)	1.98 a	5.57 a	7.85 a	9.69 b	10.40 a
RB	1.96 a	5.36 a	7.76 a	9.52 b	10.70 a
White	1.51 b	3.81 b	6.42 b	8.20 c	9.23 b
StdError	0.14	0.30	0.32	0.32	0.44

Means with different letters in a column are significantly different at 5 % level using the Least Significant Difference test. **DAE** – days after emergence

Table 2. The hypocotyl length of cabbage microgreens as affected by LEDs at different observation periods

LEDs	Hypocotyl length (cm)				
	2 DAE	4 DAE	6 DAE	8 DAE	10 DAE
Blue (B)	0.3300 ab	4.95 a	7.10 a	8.63 a	8.78 a
Red (R)	0.3125 b	4.79 a	6.86 ab	7.89 b	8.27 a
RB	0.3600 a	4.59 a	6.45 b	7.64 b	8.39 a
White	0.3250 b	3.20 b	5.42 c	6.77 c	7.32 b
StdError	0.01	0.27	0.25	0.27	0.36

Means with different letters in a column are significantly different at 5 % level using the Least Significant Difference test. **DAE** – days after emergence

It was reported that blue light stimulates the elongation, which results in longer hypocotyls (19). Additionally, the presence of cryptochromes (a flavoprotein blue light receptor) found in plants, blue light mediated the elongation, whereas red light is detected by phytochromes (6). Previously reported that the elongation is associated with the GA_{20} oxidase and gene expression under blue light (20). A further investigation into the gene expression and the enzymatic activity of GA_{20} oxidase and the activity of the photoreceptors (phytochrome and cryptochrome) in cabbage microgreens grown under LEDs is recommended. Additionally, the photoreceptors contribute to the elongation in plants, which was observed in the elongation of the hypocotyls that became longer under red and blue LEDs (14, 17, 18).

Leaf length

The utilisation of LEDs significantly influenced the leaf length of cabbage microgreens (Table 3). It was observed that from 2 to 10 DAE (except at 6 DAE), blue, red and RB LEDs constantly denoted longer leaves of microgreens. This indicates that the elongation of leaves, the use of LEDs, except white, play a pivotal role in obtaining longer leaves, including longer hypocotyls and taller microgreens. Leaf growth is affected by light, as previously reported (21). This was observed in the study wherein RB had longer leaves than white LED.

Root length and root count per microgreen

The root length of cabbage microgreens was not affected by LEDs (Table 4). However, the root count per microgreen showed a significant variation among LEDs (Table 4). A high root count was observed in microgreens grown in blue, RB and white LEDs. But the red LED had the lowest root count per microgreen among blue and RB LEDs. Results show that blue and RB LEDs significantly contributed to the stimulation of root count rather than root elongation. These LEDs displayed a similar effect to a white LED. Red LED induced a larger leaf area of cabbage microgreens as compared with white and blue LEDs.

Chlorophyll content

A high SPAD index was observed in microgreens with white LED, which was significantly higher than the other LEDs (Table 4).

Fresh weight per microgreen, fresh weight yield and dry matter

The fresh weight per microgreen of cabbage microgreens was substantially affected by LEDs (Table 5). Heavier fresh weight of microgreens was obtained in red and RB LEDs. However, the latter exhibited a comparable fresh weight to microgreens grown in blue LED. The white LED had the lightest fresh weight among the LEDs used. It was previously reported that fresh biomass was higher in amaranth and turnip green microgreens exposed to blue than red and white (22), which was contradicted by the current results. However, they found that a higher fresh weight was observed in red light than in white, which concurred with the present study. The difference may be due to species-specific factors in which the effect of LEDs varies.

On the other hand, the low fresh weight in blue LED may be due to the activity of ribulose-1,5-bisphosphate carboxylase/oxygenase (Rubisco), which plays a pivotal role in photosynthesis. It was previously reported that tomato seedlings with blue light exhibited a higher amount of Rubisco along with reduced biomass (11). This may explain why blue LED exposure to cabbage microgreens displayed a low fresh weight as compared with red and RB LEDs. However, a further investigation is needed on the amount of Rubisco in cabbage microgreens.

However, the fresh weight yield was affected by LEDs. The same trend with fresh weight per microgreen to fresh weight yield

Table 3. The leaf length of cabbage microgreens as affected by LEDs at different observation periods

LEDs	Leaf length (cm)				
	2 DAE	4 DAE	6 DAE	8 DAE	10 DAE
Blue (B)	1.66 a	0.69 ab	1.23 a	1.85 a	2.36 a
Red (R)	1.67 a	0.77 a	1.00 a	1.80 a	2.14 ab
RB	1.60 a	0.77 a	1.31 a	1.88 a	2.31 a
White	1.19 b	0.62 b	0.99 a	1.43 b	1.92 b
StdError	0.13	0.04	0.17	01.0	0.13

Means with different letters in a column are significantly different at 5 % level using the Least Significant Difference test. **DAE** – days after emergence

Table 4. The root length, root count per microgreen, leaf area and chlorophyll content of the cabbage microgreens as affected by light-emitting diodes

Light-emitting diodes	Root length (cm)	Root count per microgreen	Chlorophyll content (SPAD Index)
Blue (B)	2.99 a	5.95 a	18.98 b
Red (R)	2.70 a	5.03 b	18.80 b
RB	2.77 a	5.95 a	19.92 b
White	2.10 a	5.38 ab	21.89 a
StdError	0.31	0.34	0.90

Means with different letters in a column are significantly different at 5 % level using the Least Significant Difference test

Table 5. The fresh and dry weights per microgreen, fresh weight yield and dry matter of cabbage microgreens as affected by light-emitting diodes

Light-emitting diodes	Fresh weight per microgreen (g)	Fresh weight yield (kg m^{-2})	Total soluble solids (°Brix)	Dry matter (%)
Blue (B)	0.1119 b	5.38 b	4.67 a	4.01 c
Red (R)	0.1191 a	5.73 a	4.72 a	5.04 b
RB	0.1146 ab	5.51 ab	4.35 a	4.58 bc
White	0.0785 c	3.77 c	5.18 a	6.51 a
Std error	0.00	0.15	0.32	0.44

Means with different letters in a column are significantly different at 5 % level using the Least Significant Difference test

was observed. This indicates that LEDs (except white) had a substantial role in becoming heavier in weight, which may be due to the absorption of moisture from the substrate used. Although the dry matter was higher in white LED and the lowest was observed in blue LED (Table 5). But the latter showed a similarity with RB, yet higher than the red LED.

Total soluble solids

LEDs did not significantly influence the total soluble solids irrespective of colours (Table 5). This indicates that growers have the option of the LEDs to be used because there was no effect on the total soluble solids.

Pearson correlation analysis of the parameters

Table 6 shows the correlation of fresh weight yield with the other parameters. It was observed that a very high and positive association exists between fresh weight yield and fresh weight per microgreen. This indicates that the fresh weight of every microgreen plays a pivotal role in obtaining heavier cabbage microgreens. This was observed in microgreens grown in red and RB LEDs (Table 5).

Moreover, microgreen height and hypocotyl length displayed a high and positive correlation with fresh weight yield. Those parameters contributed to a higher fresh weight, which was observed in red and RB LEDs (Tables 1, 2 and 5). Fresh weight yield and leaf length displayed a moderate and positive association. Moreover, a very high and positive association of hypocotyl length with microgreen height and leaf length. It was also reported by another study that microgreen height and hypocotyl length had a very high and positive association with each other (23). Additionally, fresh per microgreen contributed to high microgreen yield (23, 24).

Conclusion

Red, blue and RB LEDs produced longer microgreens and hypocotyls than white LEDs. Whereas the leaves were longer when exposed to blue and RB LEDs compared to the white LED. Blue and RB LEDs produced higher root counts, which were higher than red LEDs. But the white LED showed a similar root count to the other LEDs. However, white LED produced a higher chlorophyll content. Red and RB LEDs produced a higher fresh weight of microgreens than white LEDs. Fresh weight per microgreen and fresh weight yield of microgreens displayed a positive relationship. Likewise, microgreen height, hypocotyl length and leaf length displayed a positive and significant association with a high yield of cabbage microgreens. To obtain a higher fresh weight yield of cabbage microgreens, either red or RB LED is recommended.

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Authors' contributions

MG carried out the conceptualisation, data curation, methodology, investigation and writing original draft and editing; RJGR carried out the conceptualisation, methodology, investigation, data analysis, writing draft and final manuscript; MBSGB, AILP and CBAAB participated in the methodology, data analysis and writing and editing draft and final manuscript. All authors read and approved the final manuscript.

Compliance with ethical standards

Conflict of interest: The Authors do not have any conflict of interest to declare.

Ethical issues: None

References

1. Bhaswant M, Shandmugam D, Miyazawa T, Abe C, Miyazawa T. Microgreens-a comprehensive review of bioactive molecules and health benefits. Molecules. 2023;28:867. https://doi.org/10.3390/molecules28020867
2. Zhang Y, Xiao Z, Ager E, Kong L, Tan L. Nutritional quality and health benefits of microgreens, a crop of modern agriculture. J Future Foods. 2021;1:58-66. https://doi.org/10.1016/j.jfutfo.2021.07.001
3. Chunthawodtiporn J, Kuengsaard T, Manochai B, Pornwongthong P. Nutritional properties of nine microgreens consumed in Thailand. Appl Sci Eng Prog. 2023;16:1-9.
4. Chen M, Chory J, Fankhauser C. Light signal transduction in higher plants. Ann Rev Genet. 2004;38:87-117. https://doi.org/10.1146/annurev.genet.38.072902.092259
5. Kreslavskii V, Los D, Schmitt F, Zharmukhamedov S, Kuznetsov V, Allakhverdiev S. The impact of the phytohormones on photosynthetic processes. Biochimica et Biophysica Acta. 2018;1859:400-8. https://doi.org/10.1016/j.bbabio.2018.03.003
6. Kong Y, Zheng Y. Magic blue light: a versatile mediator of plant elongation. Plants. 2023;13:115. https://doi.org/10.3390/

Table 6. The correlation analysis of the fresh weight yield with the other parameters

Parameters	FWPM	MH	LL	HL
Fresh weight yield	1.00**	0.70**	0.59*	0.69**
Hypocotyl length	0.69**	0.99**	0.79**	-

** - significant at 1 % level; * - significant at 5 % level. Correlation range: 0.80-1.00 = very high; 0.60-0.79 = high; 0.40-0.59 = moderate; 0.20-0.39 = low; 0.00-0.19 = very low. **FWPM** – fresh weight per microgreen; **MH** – microgreen height; **HL** – hypocotyl length; **LL** – leaf length

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7. Fukuda N, Ajima C, Yukawa T. Antagonistic action of blue and red light on shoot elongation in petunia depends on gibberellin, but the effects on flowering are not generally linked to gibberellin. Environ Exp Bot. 2016;121:102-11. https://doi.org/10.1016/j.envexpbot.2015.06.014

8. Lu N, Maruo T, Johkan M, Hohjo M, Tsukakoshi S, Ito Y, et al. Effects of supplemental lighting with light-emitting diodes (LEDs) on tomato yield and quality of single-truss tomato plants grown at high planting density. Environ Control Biol. 2012;50:63-74. https://doi.org/10.2525/ecb.50.63

9. Wang H, Gu M, Cui J, Shi K, Zhou Y, Yu J. Effects of light quality on CO_2 assimilation, chlorophyll-fluorescence quenching, expression of Calvin cycle genes and carbohydrate accumulation in *Cucumis sativus*. J Photochem Photobiol B: Biology. 2009;96:30-7. https://doi.org/10.1016/j.jphotobiol.2009.03.010

10. Son K, Oh M. Leaf shape, growth and antioxidant phenolic compounds of two lettuce cultivars grown under various combinations of blue and red light-emitting diodes. HortScience. 2013;48:988-95. https://doi.org/10.21273/HORTSCI.48.8.988

11. Izzo L, Mele B, Vitale L, Vitale E, Arena C. The role of monochromatic red and blue light in tomato early photomorphogenesis and photosynthetic traits. Environmental and Experimental Botany. 2020;179:104195. https://doi.org/10.1016/j.envexpbot.2020.104195

12. Association of Official Analytical Chemists. Official methods of analysis AOAC International. 17th ed. Maryland: Association of Official Analytical Chemists; 2000.

13. Spaninks K, van Lieshout J, van Leperen W, Offringa R. Regulation of early plant development by red and blue light: a comparative analysis between *Arabidopsis thaliana* and *Solanum lycopersicum*. Front Plant Sci. 2020;11. https://doi.org/10.3389/fpls.2020.599982

14. Ponno J, Hoecker U. Signaling mechanisms by *Arabidopsis* cryptochromes. Front Plant Sci. 2022;13:844714. https://doi.org/10.3389/fpls.2022.844714

15. Ohashi-Kaneki K, Takase M, Kon N, Fujiwara K, Kurata K. Effect of light quality on growth and vegetable quality in leaf lettuce, spinach and komatsuna. Environ Control Biol. 2007;45:189-98. https://doi.org/10.2525/ecb.45.189

16. Huche-Thelier L, Crespel J, Le Gourriecrec J, Morel P, Sakr S, Leduc N. Light signaling and plant responses to blue and UV radiations-perspectives for applications in horticulture. Environ Exp Bot. 2016;121:22-38. https://doi.org/10.1016/j.envexpbot.2015.06.009

17. Gomez C, Izzo L. Increasing efficiency of crop production with LEDs. AIMS Agri Food. 2018;3:135-53. https://doi.org/10.3934/agrfood.2018.2.135

18. Kusuma P, Pattison P, Bugbee B. From physics to fixtures to food: current and potential LED efficacy. Hort Res. 2020;7. https://doi.org/10.1038/s41438-020-0283-7

19. Kong Y, Kamath D, Zheng Y. Blue versus red light can promote elongation growth independent of photoperiod: a study in four *Brassica* microgreens species. HortSci. 2019;54:1955-61. https://doi.org/10.21273/HORTSCI14286-19

20. Fukuda N, Yoshida T, Olsen J, Senaha C, Jikukaru Y, Kamiya Y. Short main shoot length and inhibition of floral bud development under red light can be recovered by application of gibberellin and cytokinin. Acta Hort. 2013;956:215-22. https://doi.org/10.17660/ActaHortic.2012.956.23

21. Wang S, Liu X, Liu X, Xue J, Ren X, Zhai Y, Zhang X. The red/blue light ratios from light-emitting diodes affect growth and flower quality of *Hippeastrum hydridum* 'Red Lion'. Front Plant Sci. 2022;13. https://doi.org/10.3389/fpls.2022.1048770

22. Toscano S, Cavallaro V, Ferrante A, Romano D, Patane C. Effects of different light spectra on final biomass production and nutritional quality of two microgreens. Plants. 2021;10. https://doi.org/10.3390/plants10081584

23. Fermin J, Rosales R, Gregorio-Balbas M, Pungtilan A, Balbas C. Carbonized rice hull and vermiculite as substrates for indoor farming of pechay microgreens. Eco Envi Conserv. 2025;31:27-32. https://doi.org/10.53550/EEC.2025.v31i01.004

24. Rabago A, Rosales R, Gregorio-Balbas M, Pungtilan A. Utilization of locally available substrates and their effect on the growth and yield of cauliflower (*Brassica oleracea* botrytis group) microgreens. Basrah J Agric Sci. 2024;37:276-87. https://doi.org/10.37077/25200860.2024.37.2.21

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