E-ISSN: 2618-0618
P-ISSN: 2618-060X

www.agronomyjournals.com
2022; 5(1): 40-42
Received: 22-11-2021
Accepted: 24-12-2021

B Pavan Kumar Naik
Department of Horticulture, Pydah Educational Institution, Kakinada, Andhra Pradesh, India

G Sekhar
Department of Horticulture, Pydah Educational Institution, Kakinada, Andhra Pradesh, India

A Suryakumari
Department of Horticulture, Pydah Educational Institution, Kakinada, Andhra Pradesh, India

G Shiva Govinda Rajulu
Department of Horticulture, Pydah Educational Institution, Kakinada, Andhra Pradesh, India

K Harshini
Department of Horticulture, Pydah Educational Institution, Kakinada, Andhra Pradesh, India

L Akhila Sai Deepika
Department of Horticulture, Pydah Educational Institution, Kakinada, Andhra Pradesh, India

Corresponding Author:
B Pavan Kumar Naik
Department of Horticulture, Pydah Educational Institution, Kakinada, Andhra Pradesh, India

Effect of growth and yield of mustard (*Brassica juncea*) microgreens on different growing medias in indoor condition

B Pavan Kumar Naik, G Sekhar, A Suryakumari, G Shiva Govinda Rajulu, K Harshini and L Akhila Sai Deepika

Abstract
Microgreens are fresh, edible vegetables considered as good nutritional benefits because of presence of their high minerals. Microgreens provides an intense experience that will elevate the overall flavor of any dishes. Microgreen cultivation leads to the biodiversity protection by selecting wild species which gives high nutrient content. In this studies, by using 5 different growing medias as treatments the experiment is conducted. The experimental material comprised of five growing medias like Soil, Water, Vermicompost, Cocopeat and FYM. Observations were recorded in five randomly chosen plants for emergence of seeds (%), plant height (cm), plant weight (gm) and days taken to harvest, yield per tray (gm) and yield per hectare (kg). The character emergence of seeds day 3 were shown a early performance on treatment (T1 and T5). The treatment (T4) cocopeat were shown a highest plant height (cm) at harvest day 7. Plant weight (gm) were shown highest performance on (T3) vermicompost. Days to taken for harvest (T3) vermicompost was showed a early performance and the yield per tray (gm) treatment (T3) were showed a highest yield.

Keywords: Microgreen, mustard, media, biodiversity

Introduction
Microgreens are began appearing on the menu of restaurant in many cities as a salad. First it has appeared in California, United States, in the early 1980's. While they were initially used as a form of garnish, chef's now realize they also add flavor and visual appeal when included in all types of doses and recipes. Microgreens provides an intense experience that will elevate the overall flavor of any dishes. Mustard is a very important crop. It belongs to the family Brassicaceae and the scientific name of mustard is *Brassica juncea*, chromosome number is 2n=32. It is originated in southern Mediterranean region and brown mustard is introduced from china to north India and later it is widely distributed to whole over the world. Micro greens also known as vegetable confetti or micro herbs when referring to aromatic herbs. Microgreen cultivation leads to the biodiversity protection by selecting wild species which gives high nutrient content.

Healthy diet through microgreens regulates weight gain, cholesterol and protects from cardiac diseases. Mustard microgreens are capable for fighting with diabetes, clear out sinuses, and helps to relieve congestion. These acts as detoxifying agent to purify and strengthen the blood, diuretic to support kidney function. Microgreens cure anaemia, reduces the risk of eye diseases, maintains the strong and healthy bones and promotes blood clotting. Mustard microgreens stimulates blood circulation and effective against fever and colds. Microgreens contain more nutrient and less microbial contamination than sprouts. Due to increase in consumer awareness about microgreens importance, short production cycle leads to the demand in these years. Controlled environmental agriculture allows year-round harvesting of microgreens and the manipulation of light quantity and quality to alter nutritional attributes of plants. Microgreens generate little or no food wastage during consumption as no biomass gets wasted as trimming. Microgreens are difficult to store, due to their high surface area to volume ratio, high respiration rate, and delicate leaves that easily wilt, rapid post-harvest decay transpiration, leakage of nutrient rich exudates, tissue damage and early senescence.

Materials and Methods

The present investigation entitled "Effect of growth and yield of mustard (*Brassica juncea*) microgreens on different growing medias in indoor" was carried out during early *Rabi* season of the year 2021 at Pydah Educational Institution, Department of Horticulture, Patavala, Kakinada. The details of experimental techniques, materials and methods adopted for the study are presented in this chapter. The experimental material comprised of five growing medias *viz.*, Soil, Water, Vermicompost, Cocopeat and FYM. Observations were recorded in five randomly chosen plants for emergence of seeds (%), plant height (cm), plant weight (gm) and days taken to harvest, yield per tray (gm) and yield per hectare (kg).

Results of growth and yield parameters

Emergence of seeds (%)

Emergence of seeds (%) Day 1

In treatment (T2) water were shown a early performance of emergence of seeds (50%) at day 1 and treatment (T1) soil were also shown the early performance of emergence of seeds (30%) at day 1, followed by treatment (T5) farm yard manure (15%), treatment (T3) vermicompost (10%) and treatment (T4) cocopeat (5%) of seeds emergence.

Emergence of seeds (%) Day 2

In treatment (T5) farm yard manure were showed a early seed emergence (95%) at day 2 and treatment (T1) soil were also showing early performance of emergence of seed (90%) at day 2, followed by treatment (T2) water (85%), treatment (T3) vermicompost (65%) and treatment (T4) cocopeat (50%) of seed emergence was shown.

Emergence of seeds (%) Day 3

In treatment (T5) farm yard manure were shown a early seed emergence (100%) at day 3 and treatment (T1) soil were also showing early performance of emergence of seed (100%) at a day 3, followed by treatment (T2) water (95%), treatment (T4) cocopeat (90%) and treatment (T3) vermicompost (85%) of seed emergence was shown**.**

Emergence of seeds (%) Day 4

The treatment (T2) water. (T3) vermicompost and (T4) cocopeat were show in a late performance of emergence of seed on day 4.

Plant height (cm)

Plant height (cm) Day 3

In treatment (T5) farm yard manure were showed the highest height (7.94 cm), followed by treatment (T1) soil (4.88 cm) and treatment (T3) vermicompost (4.78 cm) were also showed highest performance after treatment (T5) farm yard manure at day 3. The treatment (T2) water (2.54 cm) were shown least performance at day 3.

Plant height (cm) Day 4

In treatment (T5) farm yard manure were shown the highest height (8.34cm), followed by treatment (T3) vermicompost (6.88cm) and treatment (T1) soil (6.54cm) were also showing the heist performance after treatment (T5) farm yard manure at day 4. The treatment (T2) water (4.44cm) were shown least performance at day 4.

Plant height (cm) Day 5

In treatment (T5) farm yard manure were shown the highest height (9.08 cm), followed by treatment (T4) cocopeat (8.9cm) and treatment (T3) vermicompost (8.62 cm) were also showing the highest performance after treatment (T5) farmyard manure at day 5. The treatment (T2) water (5.76 cm) were shown least performance at day 5.

Plant height (cm) Day 6

In treatment (T3) vermicompost were shown the highest height (10.1 cm), followed by treatment (T4) cocopeat (9.98cm) and treatment (T5) farmyard manure (7.54cm) were also showing highest performance after treatments (T3) vermicompost at day 6. The treatment (T2) water (6.34cm) were shown least performance at day 6.

Plant height (cm) Day 7

In treatment (T4) cocopeat were showed the highest height (10.84cm) followed by treatment (T2) water (7.24cm) shown the least performance at day 7.

Plant weight (gm)

The treatment (T3) vermicompost (0.064 gm) were shown highest performance of plant height at last day of harvest. Followed by treatment (T4) cocopeat (0.062 gm) and treatment (T5) farm yard manure (0.056 gm) were shown highest performance after treatment (T3) vermicompost at harvest. The remaining treatments (T1) soil (0.052 gm) and treatment (T2) water (0.044 gm) were shown the least performance at harvest.

Days to taken for harvest

The treatment (T3) vermicompost (6 days) were showed a early performance followed by treatments (T1) soil (7 days), (T2) water (7 days), (T4) cocopeat (7 days) and (T5) farm yard manure (FYM) (7 days) were shown late performance.

Yield per tray (gm)

In treatments (T3) vermicompost were showed the highest yield of (54.58 g) followed by treatment (T4) cocopeat (45.65 g) and treatment (T5) farm yard manure (31.21g) and treatment (T1) soil (25.06 g.). The treatment (T2) water shown (23.50 g) of lowest yield.

Yield per hectare (kg)

In treatment (T3) vermicompost (99.96 kg) were shown highest yield per hectare followed by treatment (T4) cocopeat (83.60 kg) treatment (T5) farm yard manure (57.16 kg) treatment (T1) soil (45.89 kg) and treatment (T2) water (43.04 kg) with lowest yield per hectare.

Table 1: Growth and yield parameters of mustard microgreen in terms of emergence of seeds (%), plant height (cm).

Parameters	Emergence of seeds (%)				Plant height (cm)				
	Day1	Day2	Day3	Day4	Day 3	Day 4	Day 5	Day 6	Day 7
T1 - Soil	30%	90%	100%	0%	4.88	6.48	6.88	6.48	0
T2 - Water	50%	85%	95%	100%	2.54	4.44	5.76	6.24	7.24
T3 - Vermicompost	10%	65%	85%	100%	4.78	7.48	8.62	10.1	0
T4 - Cocopeat	5%	50%	90%	100%	3.36	5.42	8.9	9.98	10.84
T5 - Farm yard manure	15%	95%	100%	0%	7.94	8.34	9.08	7.54	0

Table 2: Growth and yield parameters of mustard microgreen in terms of plant weight (gm), days to taken for harvest, yield per tray (gm) and yield per hectare (kg).

Parameters	Plant weight (gm)	Days to taken for harvest	Yield per tray (gm)	Yield per hectare (kg)
T1 - Soil	0.052	7	25.06	45.89
T2 - Water	0.044	7	23.51	43.04
T3 - Vermicompost	0.064	6	54.58	99.96
T4 - Cocopeat	0.062	7	45.65	83.61
T5 - Farm yard manure	0.056	7	31.21	57.16

Conclusion

From the present study, it is concluded that there is a good scope for the development of microgreens in mustard. It is desirable direction for growth and yield characters should be evaluated further and can be exploitation for commercial cultivation The character emergence of seeds day 3 were shown a early performance on treatment (T1 and T5). The treatment (T4) cocopeat were shown a highest plant height (cm) at harvest day 7. Plant weight (gm) were shown highest performance on (T3) vermicompost. Days to taken for harvest (T3) vermicompost was showed a early performance and the yield per tray (gm) treatment (T3) were showed a highest yield.

Reference

1. Kaiser C, Ernsr M. Microgreens. CCD-CP-104. Lexington, KY: Center for crop diversification, University of Kentucky College of Agriculture, Food and Environment, 2018.
2. Chen X, Wang J, Shi Y, Zhao MQ, Chi GY. Effects of cadmium on growth and photosynthetic activities in pakchoi and mustard. Botanical Studies. 2011;52:41-46.
3. Samuoliene G, Brazaityte A, Virsile A, Miliauskiene J, Kairiene VV, Duchovskis P. Nutrient levels in brassicaceae microgreens increase under tailored light-emitting diode spectra. Frontiers in Plant Science. 2019;10:1475.
4. Marchioni I, Martinelli M, Ascrizzi R, Gabbrielli C, Flamini G, Pistelli L, *et al*. Small functional foods: Comparative phytochemical and nutritional analyses of five microgreens of the Brassicaceae family. Foods. 2021;10:427.
5. Fuente B, Lopez-Garcia G, Manez V, Alegria A, Barberia R, Cilla A. Evaluation of the Bio accessibility of Antioxidant Bioactive Compounds and Minerals of Four Genotypes of Brassicaceae Microgreens. Foods. 2019;8:250.
6. Fuente B, Lopez-Garcia G, Manez V, Alegria A, Barberia R, Cilla A. Antiproliferative effect of bio accessible fractions of four Brassicaceae microgreens on human colon cancer cells linked to their phytochemical composition. Antioxidants. 2020;9:368.
7. Brazaityte A, Sakalauskiene S, Virsile A, Jankauskiene J, Samuoliene G, Sirtautas R, *et al*. The effect of short-term red lighting on Brassicaceae microgreens grown indoors. Acta Horticulture, 2016, 1123.
8. Gao M, He R, Shi R, Zhang Y, Song S, Su W, *et al*. Differential effects of low light intensity on broccoli microgreens growth and phytochemicals. Agronomy. 2021;11:537.
9. Gioia FD, Petropoulos SA, Ozores-Hampton M, Morgon K, Rosskopf EN. Zinc and iron agronomic biofortification of Brassicaceae microgreens. Agronomy. 2019;9:677.
10. Jones-Baumgardt C, Lewellyn D, Ying Q, Zheng Y. Intensity of sole-source light-emitting diodes affects growth, yield and quality of brassicaceae microgreens. Hort Science. 2019;54(7):1168-1174.