DEPARTMENT OF BOTANY

DETAILS OF STUDY PROJECTS

2021-22

S.NO	ACADEMIC YEAR	TITLE OF THE FILED PROJECT/STUDY PROJECT	STUDENTS PARTICIPTED			
1.	2021-22	Effect of Vermi compost on Morphological characters of Malabar Spinach (*Basella alba* L.)	S.Mounika	032-21-3030	II BZC	Total Projects
			G.Chandralekha	03221-3009	II BZC	01
			G.Mounika	032-21-3007	II BZC	
			V.Greeshma	032-21-3037	II BZC	
			Y.BabyRani	032-21-3041	II BZC	

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ISO 9001:2015 CERTIFIED INSTITUTION

STUDENT STUDY PROJECT

(FIELD STUDY)

"Effect of Vermi compost on Morphological characters of Malabar Spinach (*Basella alba* L.)"

By

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DEPARTMENT OF BOTANY

2021-22

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We would like to express my special thanks of gratitude to our sir. Dr.K.Vijay Kumar, who guided us during this project work on the topic a effect of vermi compost on morphological characters of Malabar Spinach (Basella alba L.) plant as well as our principal P.Ramachandra Rao and who gave the permission to utilize the computers language Department, also in the Department of Botany. Which also helped us in doing tabulation and typing work we came to know about so many things are really thanks to them.

Secondly, I would also like to thank my parents and friends who helped me a lot in this project within a limited time also to Sri.T.Narasimha Rao O.S for help at the Botanical garden.

Team Members.

S. Mounika.

V. Greeshma.

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Y. Baby rani.

G. Mounika.

Effect of vermi compost application on Morphological vegetative characters of Malabar spinach (Basella abla L.)

Aim: To study the effect of vermi compost application on morphological vegetative characters of malabar spinach

Objectives: 1. To measure the average height of plant in cm.

2 .To measure the average no. of leaves

3. To measure the average length of leaves

Introduction

Malabar Spinach is a leafy vegetable.

- These Malabar spinach vegetable very chiefly available in our surrounding areas.
- It is a seasonal vegetable
- The leaves are simple.
- Flowers are inconspicuous and produce dried fruits
- According to world wild malabar spinach cultivation by china, USA, Kenya, turkey, Japan, Indonesia, Italy etc.
- In some countries Malabar spinach is packaged in bags filled with nitrogen gas in order to conserve its freshness,
- China, United States are the highest cultivation of Malabar spinach production worldwide.

Uses:

- Malabar Spinach is edible vegetable
- Malabar Spinach leaves contain vit –A, K fibre, Phosphorus, Thiamin.
- Malabar Spinach is used in diabetes managements cancer prevention, promotes digestion, healthy skin and hair
- Malabar Spinach is versatile vegetable, also used as a raw vegetable.
- It is a rich source of iron vitamin, antioxidants

Malabar Spinach cultivation in india :- Malabar Spinach is hot season plant grown across all India, this can be grown in backyards, open fields commercially

- Spinach crop can be open fields harvested after 6-8 weeks from planting.

Improved varieties of Malabar spinach in india :-

a)Pusa Jyothi b) Pusa all green

- It is also cultivating in Telangana and Andhra Pradesh states

BOTANY OF THE PLANT

Botanical Name: Basella alba L.
Class: Magnoliopsida
Sub-class: Caryophyllidea
Order: Caryophyllales
Family: Basellaceae
Origin: South East Asia

Morphological characteristics:

Habit:- Malabar Spinach is a vine annual herb creeping nature .

Habitate:- It is an annual plant rarely biennial) growing as tall as 30cm spinach may over winter in temperature regions

Seed Variety: Pusajyothi,pusa all green, Punjab green

Root System: Adventitious roots.

Stem: It is an edible perennial vine, which is propagated by fragmentation of the rhizome.

Leaf: The leaves are alternate, simple, and ovate to triangular and very variable in size: 2-30 cm (1-12) in long and 1-15 cm (0.4-5-9) in broad, with larger leaves at the base of plant and small leaves higher on the flowering stem.

Reproductive Characteristics:

Inflorescence: Bisexual flowers.

- Raceme or spike on a long peduncle.
- Flower are inconspicuous and produce small dried fruits
- The edible leafs are arranged in a rosette
- From the center of the rosette seed stalk arises
- Indeterminate inflorescence,

Androecium: Androecium with five inserted stamens which are with short filaments and versatile anthers

Gynoecium: Gynoecium with globose ovary, ovules sub sessile three syles and linear stigmas.

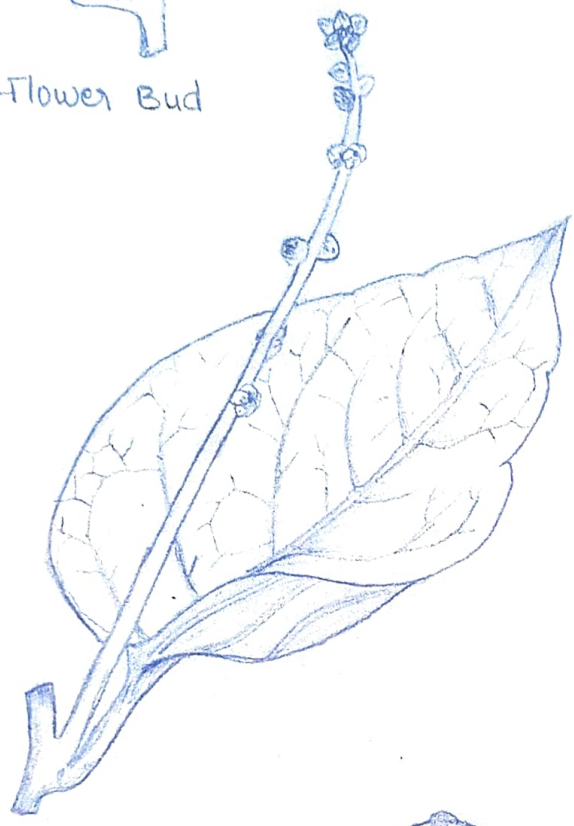
Fruit of a size of gram having fleshy perianth and thin pericarp

Floral Diagram of Basella alba L.

Flower Bud

Flower cut vertically (Image)

Floral diagram



Leaf

Seed cut

Embryo

Accession no: JVR 0016

HERBARIUM SPECIMEN

DEPARTMENT OF BOTANY / ZOOLOGY

College ... JVR govt degree college ...

Serial No. ... 16 ... Date ... 9-11-22 ...

Common Name ... Malabar spinach ...

Botanical Name ... Basella alba L. ...

Natural Order ... Basellaceae ...

Locality ... Nandipadu ...

Collected by ... V. Greeshma ... Class ... III B.Z.C ...

Hall Ticket No. ... 032213037 ...

Materials and Methods

Metal spade, pencil .Scale, seeds, vermicompost ,etc, the seeds were collected and sown to raise the seedlings common conditions were maintained to raise the seedings

Materials: Scale,Pencile,spade, Harvesting field, vermicompost.

Methods: A step by step, harvesting of spinach from date of plantation
On 15-09-2022 harvesting productivity

Place of study: Field plots were made at Botanical garden, JVR Government College, Sathupally.

Field Preparation: Prepared well ploughings to make field weed free.

Ploughing field taken as 4 Lines for sowing.

Dimensions: Field should be taken measurements of length as -210 cm and width 174 cm

Type of Soil: Silt Soil

Soil PH: 7.5

Sowings Seeds: Propagation is done or sowing can be done by line sowing on 15-09-2022

CULTIVATION OF MALABAR SPINACH

Field preparation:

- Soil should be prepared by ploughing 2,3 times
- Sowing can be done by line showing and broad casting method

Irrigation requirement:

- First irrigation should be given after showing
- Drip irrigation is improves to beneficial for Malabar spinach cultivation.
- For good yield using vermi compost

Weed control:

Regular weeding should be carried out by removing dead leaves or diseased leaves.

Weedicides can be applied to control the weeds.

Pruning and training of Malabar:

In pruning process simply cut the thick. Fleshy leaves while retaining some stem on the Malabar spinach

- As a vine can reach up to 30 Feet height put on a trellis, wall or fence

Irrigation requirements:

- After sowing seeds irrigation must be requires for the germination of seed
- Field requires moisture
- Water provided at day by day for give good condition to germinate.

Germination: After sowing seeds, it takes 5 days gap on 20-09-2022, seeds start germinating

Plant with 2 leaves: After the germination the early stage of plant with 2 leaves on 24-09-2022

Plant with 4 leaves: Plant is growing and with 4 leaves by October 17-2022.

Plant requires Measurements: On 20-10-2022, by considering the growth of plant has taken measurements of plant height, no. of leaves, length of leaves.

First Reading: On 20-10-2022,

- To measure average height of plant 8.8
- To measure average no.of leaves are 4.8
- To measure average length of leaves 5.51

Application of Vermi Compost:

- On 20-10-2022 at my college , we collected vermi compost from vermi compost pit
- Vermi compost given to the plant at stage, the plant with 4 leaves and also provide water for good yield.
  Second Reading: After application of vermi compost we took second readings of plant height, no. of leaves and leaf length
- Second reading taken on 25-10-2022 with the help of scale and pencile
- To measurer average plant height 11.0
- To measure average no. of leaves 7.4
- To measure average length of leaves 7.7

Flowering: Flowering started on 28-11-2022 Inflorescence is racemose or spike on a long peduncle. Flowers are inconstituencing

DATE OF PLANTING (DOP) :

15-09-2022

Applications of Vermicompost :

Vermicompost produced at J.V.R Government College Sathupally. Was taken for application to the Malabar spinach in field experiment

1. Date of vermicompost Treatment 20-10-2022
2. Quantity used. 70 grams of vermicompost
3. We added vermicompost rows wise
4. We added vermicompost for 4 rows
5. Irrigation was provided every alternate day from day of planting
6. Field plot dimensions 210 x 174 cm

RESULTS

Before vermicompost :

The average lowest plant height is in 4th row (5.72 cm) and average highest plant height si in 2nd row (8.8cm)

The lowest no. of leaves are in 1st row (3.8) and average highest no. of leaves are in 2nd row (4.8)

The average lowest leaf size is in 3rd row (3.32cm) and average highest leaf size is in 2nd row (5.54cm)

After vermicompost :

The average lowest plant height is in 1st and 4th rows (7.5cm&7.5cm) and the average highest plant height is in 2nd row (11.0cm)

The average lowest no .of leaves are in 2nd row (5.4) and average highest no. of leaves are in 2nd row (7.4)

The average lowest leaf size is in 3rd row (4.5cm) and the average highest leaf size is in 2nd row (7.7cm)

RESULTS

BEFORE VERMI COMPOST

i) Plant height:

S.No	1st row	2nd Row	3rd Row	4th Row
1	**4**	**8.5**	**7.4**	**8**
2	**5**	**10**	**4.5**	**3.8**
3	**9.1**	**8**	**4.7**	**5**
4	**6.3**	**10**	**7**	**4.8**
5	**6.4**	**7.5**	**6.2**	**7**
Total	**30.8**	**44**	**29.8**	**28.6**
Average	**6.4**	**8.8**	**5.96**	**5.72**

ii) Number of leafs:

S.No	1st row	2nd Row	3rd Row	4th Row
1	4	6	5	4
2	3	5	4	3
3	3	6	3	4
4	4	3	3	5
5	5	4	6	6
Total	19	24	21	22
Average	3.8	4.8	4.2	4.4

iii) Plant leaf length:

S.No	1st row	2nd Row	3rd Row	4th Row
1	4.9	7	5	5
2	3	5	3	3.5
3	6.3	6	2.6	3
4	4	4.7	3	4.1
5	4	5	3	5
Total	22.6	27.7	16.6	20.6
Average	4.52	5.51	3.32	4.12

After Vermicompost Treatment:

i)Plant Height:

S.No	1st row	2nd Row	3rd Row	4th Row
1	7	12.5	9	10
2	5.5	11.5	7	5
3	9.5	12	6.5	6
4	7.5	10	8.5	7.5
5	8	9	8	9
Total	37.5	55	39	37.5
Average	7.5	11.0	7.8	7.5

ii) No of leaves:

S.No	1st row	2nd Row	3rd Row	4th Row
1	6	12	5	5
2	5	7	5	5
3	7	85	6	5
4	4	5	4	7
5	6		7	7
Total	28	37	27	29
Average	5.6	7.4	5.4	5.8

iii) Plant Leaf size

S.No	1st row	2nd Row	3rd Row	4th Row
1	6	7	3.5	6
2	3.5	9.5	6	4
3	7	8	4	3.8
4	6	8	4	4.5
5	4.5	6	5	6
Total	27	38.5	22.5	24.3
Average	5.4	7.7	4.5	4.86

AVARAGE PLANT VALUES

Plant Height

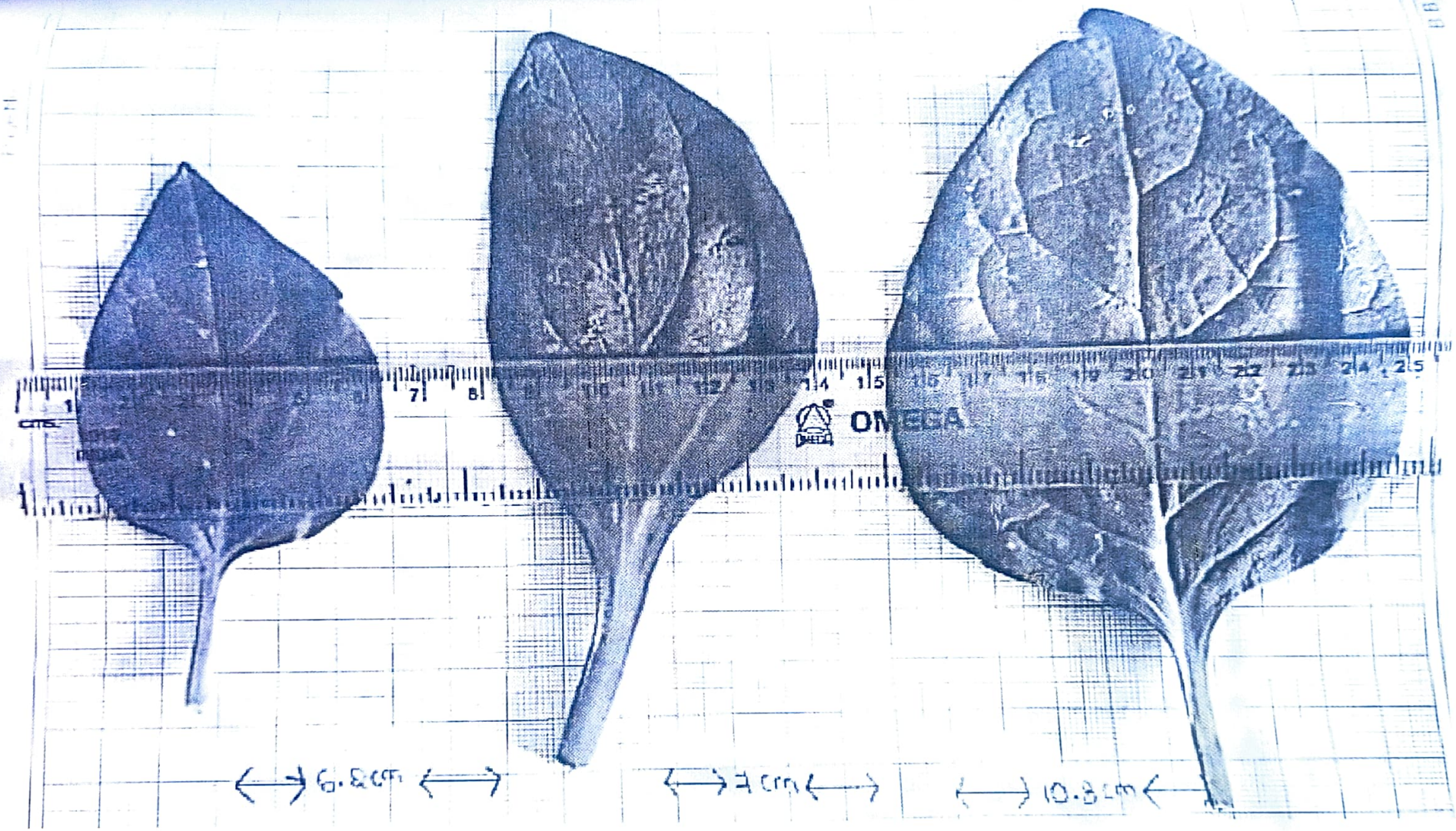
Without vermicompost		With vermicompost
Rows No	Plant height in cm	Plant height in cm
1	6.16	7.5
2	8.8	11.0
3	5.96	7.8
4	5.72	7.5

Number of leaves

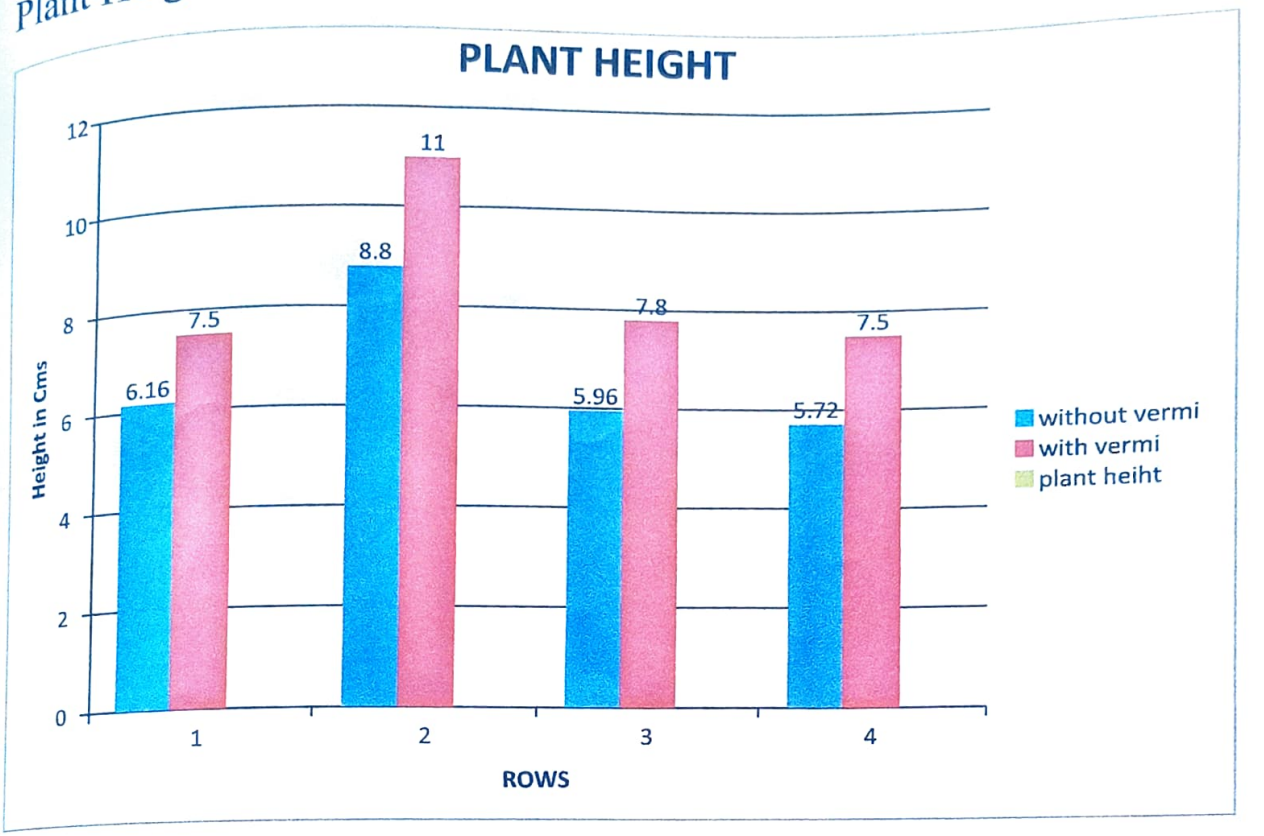
Rows No	Without vermicompost	With vermicomposot
	No. of leafs	No. of leafs
1	3.8	5.6
2	4.8	7.4
3	4.2	5.4
4	4.4	5.8

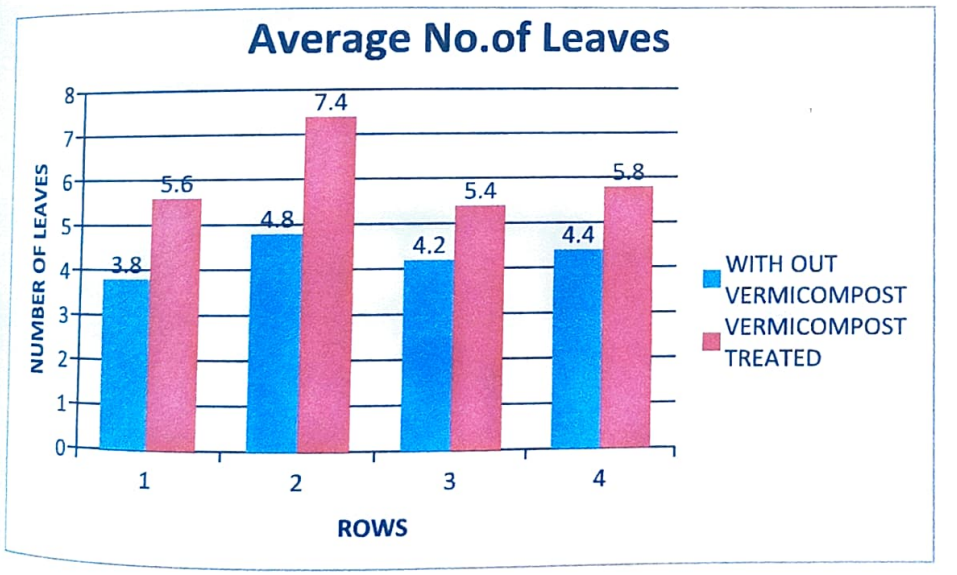
Leaf Size

Rows No	Without vermicompost	With vermicomposot
	Leaf size	Leaf size
1	4.52	5.4
2	5.54	7.7
3	3.32	4.5
4	4.12	4.86

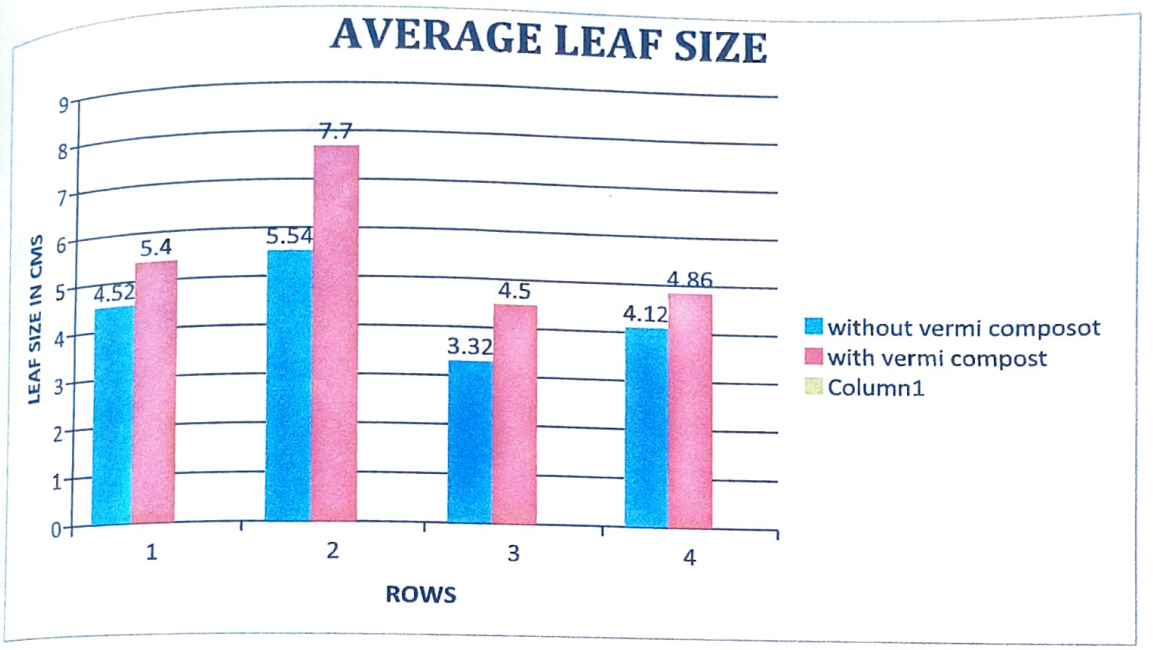

OMEGA
6.8cm
7cm
10.3cm

Plant Height cm





Average Leaf size



Discussion

At first when we planted or short seeds for first few days there is observed on yearly growth of the seeds. After few days growth of the seeds become plant. These plans started leaves length is increased number of leaves also increased gradually.

Before Vermicompost Treatment

Before were may come first growth of the plant in the first row is the average number of leaves are 4CM and average plant height 4 cm and in second row the average number of leaves 6 and average lips length is 7 cm and average plant height is 8.5 cm and In when we come to the third row the average plant height is 7.4 cm and average number of leaves is 5 and average leaf length 3 cm in 4th row the average plant height is 8 cm and number of leaf 4 and average plant leafs length is 5 cm

After vermicompost Treatment:

We added the vermi compost only for 3rd row and 4th row few days after we observed the plants of growth those applied the vermi compost is increased. Their plants height, no.of leaves, and leaf length are increased well and shown increased growth. For the 1st and 2nd row we didn't applied vermi compost but 1st and 2nd row plants are also shows well grown .for the first row the average plant height is 7.cm in taking 2nd time reading average of no.of leafs are 6 and average leaf length 6cm and in 2nd row average plants height is 12.5cm and average no.of leafs 12 and average leaf lenth 7cm and in third row average plants height is 9cm and average no.of leafs 5 and average leaf length 3.5 and in 4th row average plants height 10 cm and average no.of leaves 5 and average leaf size 6cm.shows well growth.

CONCLUSION

Basella alba L. is a edible vegetative plant and leaves shows vitamin K fibre phosphorous, and thiamine. It is a versatile vegetable. The effect of vermicompost on the morphological vegetative attributes like no. of leaves, leaf length and plant height were studied . When compared to the without vermi treatment and with vermicompost treatment showed increased no. of leaves , leaf length and plant height and thus better morphological attributes .

The leaf size and no. Of leaves should marked increase in vermi treated plant when compared to non-treated plants in the field experiment in almost all rows. The field experiment need to be repeated over large area to confirm the results obtained in this study.