



## EFFECT OF VERMICOMPOST ON QUALITY ATTRIBUTES OF A LEAFY VEGETABLE

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### ABSTRACT:

The increase in population causes an increase in the quantity and type of waste. Such wastes are undesirable pollutants to the environment and even be a health menace. As far as rural wastes are concerned, there are huge amount of organic materials that are not utilized. Vermicomposting technology is a fast growing one with its pollution free, cost effective and efficient nature. In the present study a leafy vegetable (Lalbhai) was grown using vermi-compost and urea, in the kitchen garden and was studied for its sensory characteristics. Recipe was formulated and evaluated. Three trials (T1, T2 and T3) were conducted for testing of various sensory characteristics such as appearance, colour, texture, taste, flavor, and acceptability. For this purpose, six human panelists were coded as J1, J2, J3, J4, J5 & J6. Recipe was served fresh. Based on the mean values, results were tabulated and analyzed statistically by applying 'ANOVA' test. It was observed that vermi-compost variety was significantly scored maximum than urea and control soil. It showed highly significant difference in all the three varieties when compared on organoleptic characteristics. Thus it was concluded that the Vermicompost variety is highly appreciated and more superior in all the sensory characters over urea which was statistically proved. Thus by using organic manure for farming, we can save our ecosystem and health by consuming these vegetables.

**Keywords:** J1–J6 (Judges), vermi-compost, urea, sensory characteristics, ecosystem.

### INTRODUCTION:

Environmental degradation is a major threat confronting the world and the excessive use of chemical fertilizer contributes largely to the deterioration of the environment, loss of soil fertility, soil degradation and less agricultural productivity. On the other hand large quantity of domestic and agricultural by products are wasted. In rural areas of India nearly 700 million waste is generated and this wastes were sent for unscientific land fillings, creating problems to public health and environment. There is a danger of water pollution when the leachate from a refuse dump enters surface or ground water resources. (Amir khan and Fouzia Ishaq)

Composting is biochemical process in which organic materials are biologically degraded, resulting in the production of organic by products and energy in the form of heat. (Nitika Shukla and Shelja Juneja)

Vermicomposting is a method of preparing enriched compost with the use of earthworms. It is one of the easiest methods to recycle agricultural wastes, kitchen waste and to produce quality compost. Earthworms consume biomass and excrete it in digested form called **worm casts**. Worm casts are popularly called as **Black gold**. The casts are rich in nutrients, growth promoting substances, beneficial soil micro flora and having properties of inhibiting pathogenic microbes.

Vermicompost is stable, fine granular organic manure, which enriches soil quality by improving its physicochemical and biological properties. It is highly useful in raising seedlings and for crop production with the better taste, luster, keeping quality and low pesticide residues enhancing its exportability. Vermicompost is becoming popular as a major component of organic farming system. (Bhawalkar and Bhawalkar)

#### **METHODS AND MATERIALS**

Kitchen garden of my house was selected as plot for sowing of seeds. The garden land was firstly harrowed and pre-sowing irrigation was done so as to create a favourable soil moisture level. When the soil reached the field condition, then the vermi-compost was applied uniformly and mixed with soil by harrowing. Seeds were sown in the month of July and vegetable (lalbhaji) was harvested in August. Same procedure was followed for urea and garden soil (control). Urea was added to the soil in the second week after sowing.

Sensory evaluation – It was done on the basis of organoleptic characteristics of the lalbhaji vegetable that was prepared using fresh lalbhaji, ploughed from the experimental plot, grown on vermi-compost. After collection of 100gms of lalbhaji it was cleaned, washed, chopped and added to 10ml heated oil.

¼ spoon salt was added, cooked till tender and served to the judges. Same procedure was followed for lalbhaji grown on urea and garden soil (control). The cooking time for vermicompost grown lalbhaji was 5min and 10 sec., for urea grown lalbhaji was 5min and 30 sec. and that for garden soil grown lalbhaji was 5min and 15sec. Score card was developed for the recipe on the basis of – appearance, colour, texture, taste, flavor and acceptability.

Statistical Appriasal of the data was done using –

- i) Arithmetic mean/Average
- ii) Anova test

#### **RESULTS AND DISCUSSIONS**

The purpose of the present study was effect of vermicompost on quality attributes of lalbhaji. Lalbhaji recipe was prepared and standardized and results were tabulated, analyzed and discussed:

Sensory characteristics of cooked food –

Lal Bhaji is a variety of edible leafy vegetable. Lal bhaji leaves are storehouse for many phytonutrients, antioxidants, minerals and vitamins which contribute immensely to health and wellness. The leaves and stems carry a good amount of soluble and insoluble dietary fiber.

Lalbhaji vegetable was prepared and evaluated for sensory characteristics. Discussed with results as under –

#### **LALBHAJI VEGETABLE -**

Lalbhaji vegetable was prepared and tested for its appearance, colour, texture, flavor, taste and acceptability. Each sensory characteristics with statistical treatment is discussed below –

##### **a) APPEARANCE**

Appearance (Table I) is the first appraisal of the food. Eye appeal is gained through contrasting and interesting combination of foods differing in types of colour and form.

##### **b) COLOUR**

Colour (Table II) is an important factor that regulates overall appearance of the product. The colour of the green leafy vegetable vary according to the chlorophyll content of these vegetables.

##### **c) TEXTURE**

The texture (Table III) of the food is an important factor affecting its general acceptance. Each food has its special identifying texture depending on its composition and its physical state. Texture is a factor of importance in the evaluation.

**d) FLAVOUR**

Flavour (Table IV) depends on taste, odour or aroma, temperature sensation of hot and cold texture. Flavour is the result of a number components, some of which may be present in a high proportion but most are present in low proportion.

**e) TASTE**

Taste (Table V) plays a very dominating role in food acceptability.

**f) ACCEPTABILITY**

The term acceptability (Table VI) or unacceptability is used to describe whether the product is liked or disliked by the consumer. Exterior part plays an important role for acceptability.

Variation in mean palatability scores of Vermicompost, urea and control of lalbhaji is observed from data presented in table I,II,III,IV,V,VI.

**Appearance:**

The mean scores for appearance of lalbhaji vegetable was found to be higher (V- 10) than urea and control samples (u – 9.3, c – 9.5) However, the statistical analysis did not show any insignificant difference (p=0.11) with respect to appearance of control, vermicompost and urea treated lalbhaji vegetable.

**Color**

Vermicompost treated lalbhaji showed higher mean scores for colour than urea treated and control samples (V- 10, U-9.3, C- 9.5). However, statistical analysis did not show any insignificant difference (p=0.11) with respect to colour of control, Vermicompost and urea treated lalbhaji vegetable.

**Texture:**

The mean scores for texture of lalbhaji showed variations with higher scores for Vermicompost (10) followed by control (9.5) and urea treated

sample (9.3). Statistically the differences in scores were insignificant (p= 0.11).

**Flavor:**

The flavor of cooked lalbhaji showed maxim score for Vermicompost treated sample as compared to urea and control sample (V- 10, U-9.3, and C- 9.5). However, the differences in mean scores of the three samples were observed to be statistically insignificant (p=0.11).

**Taste:**

Taste of lalbhaji vegetable grown on Vermicompost scored maximum than urea treated and control sample (V- 10, U-9.0, C- 9.5), which was found to be statistically significant (p-0.03).

**Acceptability:**

Vermicompost grown lalbhaji scored highest than other two treatments i.e. urea and control sample (V- 10, U- 9.0, C- 9.5). A significant difference (p=0.03) with respect to acceptability between the three different treatments was observed.

Thus, it can be concluded that organoleptic characteristics of vermicompost variety are more superior over urea and control variety which was statistically proved.

**CONCLUSION -**

The present study clearly indicate that vermicompost is superior to urea. Leafy vegetables grown on vermicompost are healthy, highly nutritious and no harmful residues were left in the soil, water and in the crop plants. At the same time its original colour, texture, flavour and taste was retained. Artificially cultivated vegetables required lots of chemical fertilizers and their taste, flavour and taste was not acceptable. Vermicompost is becoming popular as a major component of organic farming system.

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**Table I : Palatability Evaluation Scores For Lalbhaji Vegetable**

Judges	Appearance Of Lal Bhaji vegetable		
	Control	Urea	Vermicompost
J1	9.3	9.3	10
J2	9.3	9.3	10
J3	10	10	10
J4	10	8.6	10
J5	10	10	10
J6	8.3	8.3	10
Mean	9.5	9.3	10
F- 2.80			
P - 0.11			

**Table II : Palatability Evaluation Scores For Lalbhaji Vegetable**

Judges	Colour Of Lal Bhaji vegetable		
	Control	Urea	Vermicompost
J1	9.3	9.3	10
J2	9.3	9.3	10
J3	10	10	10
J4	10	8.6	10
J5	10	10	10
J6	8.3	8.3	10
Mean	9.5	9.3	10
F- 2.80			
P - 0.11			

**Table III : Palatability Evaluation Scores For Lalbhaji Vegetable**

Judges	Texture Of Lal Bhaji vegetable		
	Control	Urea	Vermicompost
J1	9.3	9.3	10
J2	9.3	9.3	10
J3	10	10	10
J4	10	8.6	10
J5	10	10	10
J6	8.3	8.3	10
Mean	9.5	9.3	10
F- 2.80			
P - 0.11			

**Table IV : Palatability Evaluation Scores For Lalbhaji Vegetable**

Judges	Flavour Of Lal Bhaji vegetable		
	Control	Urea	Vermicompost
J1	10	8.6	10
J2	8.6	10	10
J3	10	8.6	10
J4	9.3	10	10
J5	9.3	8.6	10
J6	10	10	10
Mean	9.5	9.3	10
F- 4.96			
P- 0.03			

**Table V : Palatability Evaluation Scores For Lalbhaji Vegetable**

Judges	Taste Of Lal Bhaji vegetable		
	Control	Urea	Vermicompost
J1	10	8.6	10
J2	8.6	8.3	10
J3	10	8.6	10
J4	9.3	10	10
J5	9.3	8.6	10
J6	10	10	10
Mean	9.5	9.0	10
F- 4.96			
P- 0.03			

**Table VI : Palatability Evaluation Scores For Lalbhaji Vegetable**

Judges	Acceptability Of Lal Bhaji vegetable		
	Control	Urea	Vermicompost
<b>J1</b>	<b>10</b>	<b>8.6</b>	<b>10</b>
<b>J2</b>	<b>8.6</b>	<b>8.3</b>	<b>10</b>
<b>J3</b>	<b>9.3</b>	<b>8.6</b>	<b>10</b>
<b>J4</b>	<b>10</b>	<b>10</b>	<b>10</b>
<b>J5</b>	<b>9.3</b>	<b>8.6</b>	<b>10</b>
<b>J6</b>	<b>10</b>	<b>10</b>	<b>10</b>
<b>Mean</b>	<b>9.5</b>	<b>9.0</b>	<b>10</b>
<b>F- 4.96</b>			
<b>P- 0.03</b>			