International Educational Applied Research Journal

A Multi-Disciplinary Research Journal

E-ISSN No: 2456-6713

EFFECT OF DOMESTIC WASTE ON GERMINATION AND SEEDLING GROWTH OF BRINJAL SOLANUM MELONGENA L.

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Abstract

The present study was carried out to observe the influence of domestic waste on seed germination and early seedling growth of brinjal Solanum melongena L. The experiment was conducted under laboratory conditions using different concentrations of aqueous domestic waste extract. Seeds of brinjal were treated with 25%, 50%, 75% and 100% concentrations of waste extract while distilled water was kept as control. Each treatment was replicated three times. It was observed that lower concentrations of domestic waste showed a positive effect on germination percentage and seedling growth. The highest germination was recorded at 50% concentration followed by 25%. Root and shoot length were also found to be maximum at 50% concentration. On the other hand higher concentrations of 75% and 100% caused a marked reduction in germination and growth. The inhibitory effect at higher concentration may be due to the presence of excess salts and toxic substances in the waste extract. The findings of this study suggest that domestic waste can be effectively utilized as an organic supplement for brinjal cultivation when used in proper dilution. However, undiluted waste may have adverse effects on seed germination and early growth.

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Introduction

Brinjal Solanum melongena L. is an important vegetable crop of the family Solanaceae and is widely grown throughout India. It occupies an important place in the daily diet due to its nutritive value and medicinal properties. With the rapid increase in urban population the generation of domestic waste has also increased considerably. Domestic waste is a rich source of organic matter and essential plant nutrients. If properly managed it can be recycled and used in agriculture as an alternative to chemical fertilizers. Earlier studies have shown that organic wastes contain growth promoting substances which can enhance germination and plant growth at lower concentrations. However at higher concentrations the same waste may become toxic due to high electrical conductivity and presence of harmful compounds. In the district of Motihari farmers often use kitchen waste for growing vegetables but there is very little scientific information available regarding its effect on brinjal germination. Keeping this in view the present investigation was undertaken to study the effect of different concentrations of domestic waste on germination and seedling growth of brinjal.

Material And Methods

Healthy and uniform seeds of brinjal Solanum melongena were collected from the local market of Motihari. Fresh domestic kitchen waste was collected and soaked in distilled water for one week. After seven days the mixture was filtered to obtain the stock solution which was considered as 100% concentration. From this stock solution 25%, 50% and 75% concentrations were prepared by adding required amount of distilled water. The experiment was conducted in petri dishes lined with filter paper. Ten seeds were placed in each petri dish and five milliliters of the respective treatment was added every day. Distilled water was used for the control set. All treatments were replicated three times. The petri dishes were kept at room temperature and observations on germination were recorded daily for ten days. On the tenth day root length and

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shoot length of seedlings were measured with the help of a scale. The data obtained were subjected to statistical analysis to find out the significance of differences among treatments.

Result And Discussion

The data obtained from the present study clearly indicated that domestic waste had a significant effect on germination and seedling growth of brinjal. It was found that seed germination increased gradually with increase in concentration up to 50% and thereafter declined. The maximum germination percentage was recorded at 50% concentration followed by 25% concentration. Similarly root length and shoot length were also found to be highest at 50% concentration. When the concentration was increased to 75% and 100% there was a sharp decrease in germination as well as in root and shoot length.

Table 1: EFFECT OF DOMESTIC WASTE ON GERMINATION AND SEEDLING GROWTH OF BRINJAL SOLANUM MELONGENA L.

S.No	Treatment	Germination %	Root Length (cm)	Shoot Length (cm)
1	Control	78	4.2	3.8
2	25%	86	5.1	4.6
3	50%	92	5.8	5.2
4	75%	64	3.1	2.9
5	100%	42	1.8	1.6

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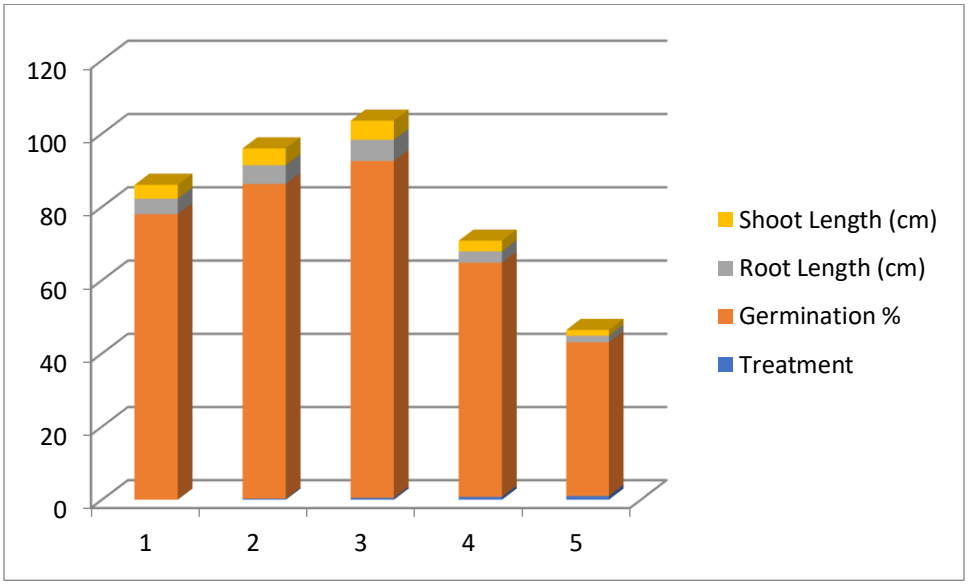

Fig- EFFECT OF DOMESTIC WASTE ON GERMINATION AND SEEDLING GROWTH OF BRINJAL SOLANUM MELONGENA L.

This reduction in growth at higher concentration may be attributed to the presence of excess salts and toxic metabolites which inhibit water absorption and metabolic activities during germination. The favorable effect of lower concentration may be due to the presence of nutrients such as nitrogen phosphorus and potassium along with some growth promoting substances present in domestic waste. These results are in agreement with earlier findings where low concentration of organic waste was found to promote seed germination while higher concentration showed inhibitory effect.

Conclusion

From the present investigation it can be concluded that domestic waste has both stimulatory and inhibitory effects on germination and seedling growth of brinjal depending upon its concentration. Lower concentrations of 25% and 50% were found to be beneficial for germination

and early growth whereas higher concentrations of 75% and 100% were toxic. Therefore it is suggested that domestic waste can be used as an organic fertilizer for brinjal after proper dilution. This practice will not only help in improving crop productivity but will also provide a useful method for the management of domestic waste.

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