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Effect of Biowaste of Onion Peel Extract on Jowar

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Abstract: *Onion peel waste generated daily as kitchen waste can be utilized as fertilizer. In present investigation effect of 1 % and their dilutions such as 3:1, 1:1 and 1:3 studied on jowar seeds. Results depicts stimulatory effect of 3:1 and 1:1dilutions on jowar seed germination and seedling growth while inhibitory effect of direct i.e. 1 percent extract and 1:3 dilution on seedling growth of jowar. Results conclude that 0.7 to 0.5 % onion peel extract can acts as liquid fertilizer. Still further study of onion peel extract required by using soil.*

Keywords: Onion, Jowar, Seed Germination, Seedling Growth.

I. INTRODUCTION

Onion (*Allium cepa*) peels are rich in calcium, iron magnesium and copper (1), hence may act as fertilizer. It is also source of several phytonutrients like flavonoids, fructooligosaccharides, thiosulfates and other sulphur compounds (2,3). Onion bulb used in large scale in cooking and generate large quantity of waste of peel. These biowaste is wasted. These biowaste may be as solid or liquid fertilizer. Laboratory and field studies required to study is effect on crop seeds. Study will help to know its concentration, application method as fertilizer. So, in present study attempt have been made to study effect of onion peel extract on Jowar seed germination and seedling growth.

II. MATERIAL AND METHOD

Biowaste of onion peels obtained from household used onions. About 1gram fresh peel of onion were soaked overnight in 100 ml water. This filtered extract was preserved at 4^0C and used as medium for seed germination studies. At the time of experiment filtrates were brought to room temperature and different concentrations (dilutions) like Direct, 3:1, 1:1 and 1:3 was prepared. For this Jowar seeds procured from crop seed shop. Seeds were thoroughly washed with water and used for experiment.

Petri dish lined with filter paper. Ten seeds of placedin petri dish.Seeds and filter paper were moistened with 5ml of each concentration of the extracts. For control, 5ml of tap was used. The experiment was done in two replicates at room temperature in dark. Germination of seeds was recorded after every 24 h intervals upto 96 h. Emergence of radical was considered as criterion for seed germination. After 96hrs, root length and shoot length of seedlings were measured. Average root and shoot lengths for each treatment were calculated. The data were statistically analysed.

III. RESULTS AND DISCUSSION

Table 1 and Figure1 depicts effect of onion peel extract on seed germination. Results indicate that stimulation of germinationin all dilutions except 1:3 dilution.

Effect of onion peel extract on seedlings shown in Table 2 and Figure 2. It is evident from the results that inhibitory effect of direct and 1:3 dilution on root, shoot length and Average total seedling length while stimulatory effect of 3:1 and 1:1dilutions. Maximum stimulation of root, shoot and average seedling length found in 3:1 concentration.

Inhibition of seedings observed in case of direct extract may due to certain allelochemicals or bioactive compounds in the extract. On the hand 1:3 dilution showed inhibition of seedlingsdue to absence or very less content of minerals or bioactive compounds in extract.Inhibition effect may be due to disturbance in various physiological processes by interference of different allelochemicals or bioactive substances (2, 3,4). Inhibition of germination and seedlings growth is due to bioactive substances flavonoids, fructo-oligosaccharides, thiosulfates and other sulphur compounds (2,3,5,6)

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etc.Patil et al. (2021) studied effect of onion and garlic biowaste on germination and growth of microgreens and used 1% onion peel extract (7). They reported stimulatory effect on microgreens and act as growth enhancer.

Table 1: Effect of Onion peel extract on Seed germination of Jowar

Treatment (Dilutions)	Percent Germination after hours			
	24	48	72	96
Control	60	100	100	100
A	70	100	100	100
B	60	100	100	100
C	100	100	100	100
D	80	90	90	90

A-Direct, B-3:1, C-1:1, D-1:3

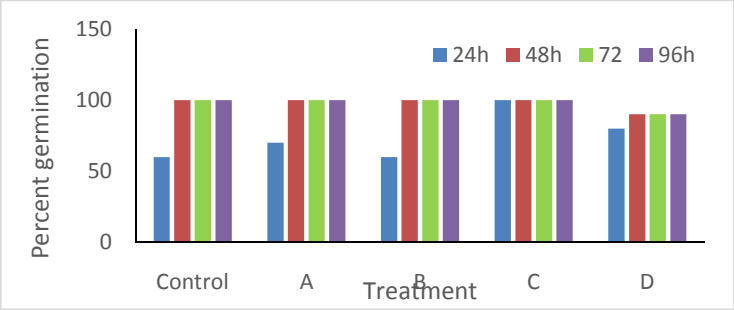

Figure 1: Effect of onion peel extract on jowar seed germination

Table 2: Effect of Onion peel extract on Jowar Seedlings

Treatment (Dilutions)	RL (cm)	SL (cm)	AVSL (cm)
Control	4.00 (±2.72)	3.55 (±2.08)	7.55(±4.64)
A	3.55 (±1.50)	3.62 (±1.97)	7.17(±3.34)
B	5.41 (±1.80)	4.23 (±2.20)	9.64(±3.68)
C	5.08 (±0.90)	4.02 (±1.57))	9.1 (± 1.45)
D	3.46 (±1.64)	3.42 (±1.79)	6.88(±3.44)

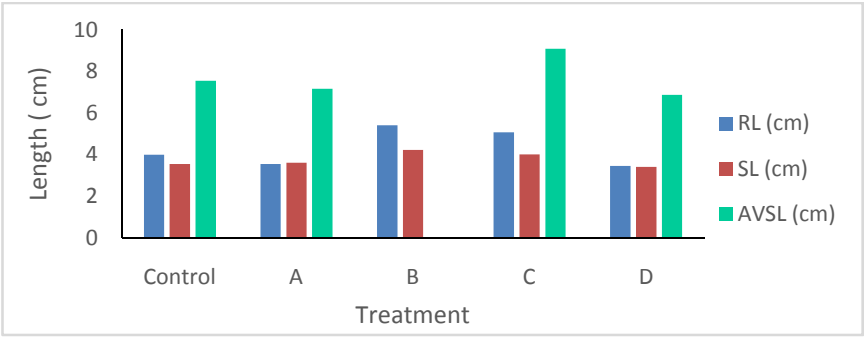

Figure 2: Effect of onion peel extract on seedlings

A-Direct, B-3:1, C-1:1, D-1:3

RL- Root length, SL- Shoot length, AVSL- Average total seedling length

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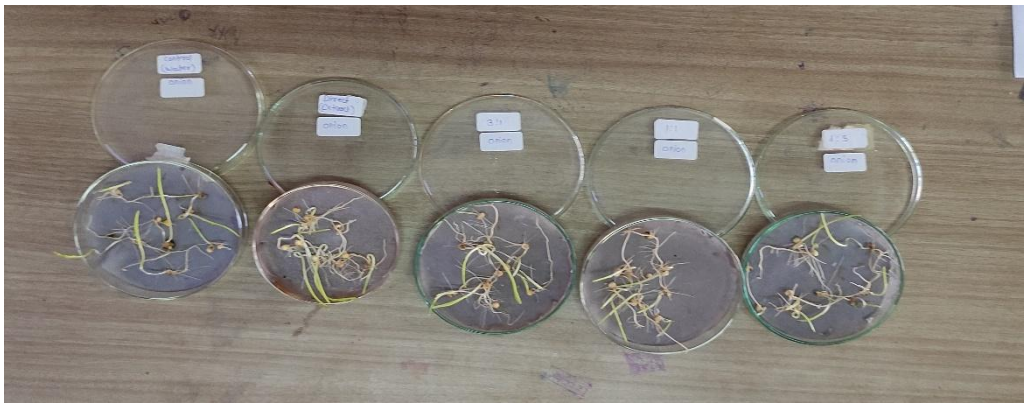

Photograph showing effect of onion peel extract on Jowar seedlings

IV. CONCLUSION

Results in present study indicateless than 1 percent concentrations and 1:3 dilution of onion peel extract showed inhibitory effect on jowar seed germination and seedling growth. Stimulatory effect ofDilutions 3:1 and 1:1 observed on seed germination as well as seedling growth. Result reveals that 0.7 to 0.5 percent onion peel extract can act as liquid fertilizer. Further study of onion peel extract required by using soil. Higher concentration peel extracts inhibit seedlings growth due to presence of higher level of bioactive substances while inhibition due to lower dilution is due to less or absence of less concentrations of bioactive compounds.

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