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THE EFFECT OF DIFFERENT CONCENTRATIONS OF DISTILLERY EFFLUENT ON LAGENARIA VULGARIS VAR. PSPL IN DARK

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ABSTRACT

The paper deals with the effects of different concentrations of distillery effluent i.e. 1%, 5%, and 10 % on Lagenaria vulgaris var. PSPL (Pusa Summer Prolific Long) in dark. Observation shows that the low and high concentrations have different effects on the seeding growth and germination of seeds.

Keywords: *Distillery Effluent, Germination, Seedling Growth, Lagenaria Vulgaris, PSPL, Cucurbits.*

Introduction

Cucurbits

The cucurbit namely Lagenaria vulgaris var. PSPL was studied for the seed germination and subsequent seedling growth. Three concentrations of distillery effluent i.e. 1%, 5%, and 10% based on trial experiments were selected for these studies. Observations show that the low and high concentrations have different effect on the seedling growth and germination of seed.

Lagenaria vulgaris var. PSPL (Pusa Summer Prolific Long)

Table 1, 4 and corresponding figures 4,5,6 shows the effects of different concentrations of the of distillery effluent on the germination and the growth of seedling of Lagenaria vulgaris var. PSPL grown in dark condition.

Effluent Concentrations in percentage (%)			
0	1	5	10
In dark			
36.00	40.83	30.14	22.22

Table 3: Effects of different concentrations of distillery effluent on the growth of Lagenaria vulgaris var. PSPL seedling in light

Concentrations of distillery effluent in percentage(%)												
	0			1			5			10		
	Days from radicle emergence											
Seedling Part	3	5	7	3	5	7	3	5	7	3	5	7
Length, cm ±SD												
Radicle	6.1	6.3	8.20	7.20	9.0	9.84	1.50	2.8	4.91	0.8	2.5	4.8
	±.57	±.51	±1.14	±1.27	±1.08	±.70	±.21	±.35	±.49	±.09	±.10	±..18
Hypocotyl	1.50	2.80	7.70	2.50	5.25	8.37	1.3	3.03	4.7	1.8	1.9	2.6
	±.09	±.46	±1.21	±.56	±1.03	±.43	±.20	±.19	±.85	±.19	±.19	±.06
Fresh weight, mg ±SD												
Radicle	30.25	36.81	50.89	34.23	47.62	57.01	15.14	12.88	22.69	2.77	10.89	±14.47
	±4.53	±3.95	±5.25	±3.40	±3.93	±4.28	±1.0	±1.60	±3.01	±.33	±1.63	±2.12
Hypocotyl	19.91	38.13	109.32	32.70	59.60	125.32	18.38	53.26	98.38	6.8	14.92	43.75
	±1.35	±2.12	±7.09	±1.77	±3.89	±5.53	±1.27	±2.69	±5.32	±.92	±1.09	±2.87
Cotyledons	135.00	107.11	100.96	120.50	100.30	79.61	150.11	140.50	124.00	128.60	109.60	105.80
	±5.03	±5.61	±6.01	±5.56	±6.01	±5.63	±4.36	±5.04	±4.80	±3.69	±3.48	±4.53
Dry weight, mg ±SD												
Radicle	6.21	6.28	8.76	7.9	8.92	10.68	2.44	2.65	5.25	1.74	2.49	3.73
	±.15	±.16	±1.39	±.52	±.59	±.70	±.02	±.14	±.25	±.12	±.09	±.28
Hypocotyl	2.06	3.29	10.70	3.46	5.36	21.24	1.67	2.89	6.12	0.49	1.16	3.01
	±.29	±.58	±1.67	±.60	±.74	±1.28	±.24	±.38	±.64	±.02	±.09	±.16
Cotyledons	23.05	17.82	9.53	19.18	12.62	5.02	28.33	24.7	16.1	27.85	21.84	16.53
	±1.30	±1.48	±2.78	±1.25	±1.28	±1.46	±1.43	±1.96	±1.58	±1.71	±1.46	±1.78

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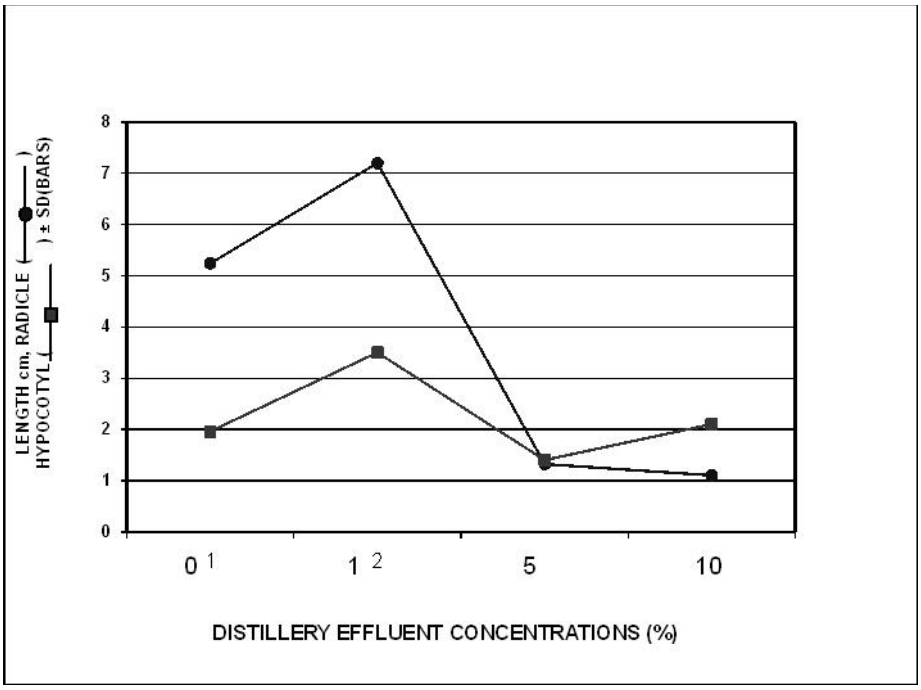

FIG.-4 **Dose response curve of 3rd day old seedlings of Lagenaria vulgaris var. PSPL in dark in different concentrations of distillery effluent**

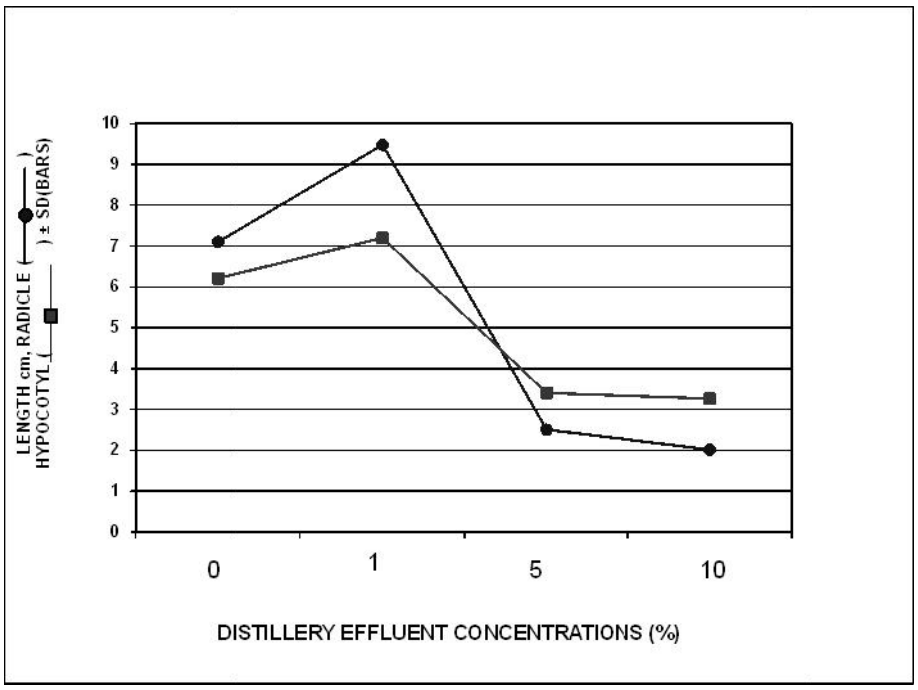

FIG.-5 **Dose response curve of 5th day old seedlings of Lagenaria vulgaris var. PSPL in dark in different concentrations of distillery effluent**

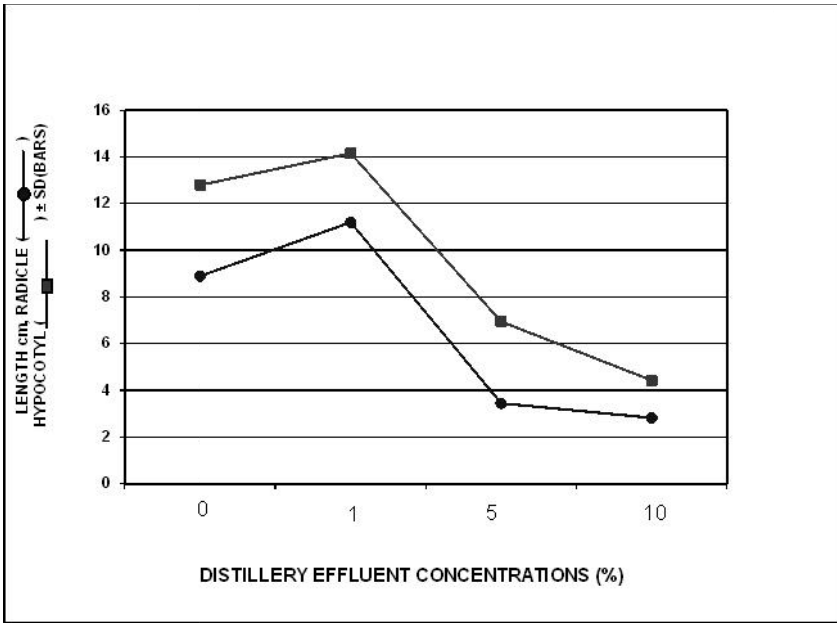

FIG. -6 Dose response curve of 7th day old seedlings of Lagenaria vulgaris var. PSPL in dark in different concentrations of distillery effluent

Germination of Seeds

Table 1 shows the effect of the distillery effluent on germination in dark condition. 1% concentration of the distillery effluent was found promotory while higher concentrations 5% and 10% were found inhibitory. The germination percentage at 1% distillery effluent in this cultivar in dark is 113.42 %, respectively. The germination percentage at 5% distillery effluent in this cultivar in dark is 83.7% of the control in dark respectively. Whereas in 10% distillery effluent in this cultivar for the same is 61.72 % of the control in dark respectively. The result reveals that there is decline in percentage germination in higher concentrations.

Seedling Growth

Tables 1 and 4 and figures 4,5, and 6 shows that the seedling growth is promoted at lower concentrations and inhibited at higher concentrations of distillery effluent. However, the inhibitory effect is seen more in 10 % distillery effluent.

In dark grown seedlings on 5th day in 1%, 5% and 10% effluent the radicle fresh weight are 112 %, 25.30 %, and 20.62 % whereas in hypocotyl fresh weight are 101.52%, 67.60%, and 61.69% on the same day and the same concentration in comparison to control. Whereas in dark condition 7th day 1% grown seedlings the length of radicle is 125.84%, its fresh weight 112.0% and dry weight 127.63% of control respectively whereas the length of hypocotyl is 110.63% its fresh weight 112.82% and dry weight 154.78% of control respectively. In the same condition 5% grown seedling on 7th day the length of radicle is 38.65% its fresh weight 41.08% and dry weight 58.42% of control respectively. The length of hypocotyl in 7th day seedling in the same concentration is 54.30%, its fresh weight 77.24% and its dry weight 96.69% of the control respectively. In the same condition 7th day seedling and in 10% concentration the radicle length is 31.69%, its fresh weight is 34.48% and dry weight 96.18% of control respectively. Whereas the length of hypocotyl on same day, same concentration and dark condition is 34.61%, its fresh weight is 53.39% and its dry weight is110.02% of the control respectively. Tables 2 to 4 show the results of the observations of the dry matter transfer, their distribution method from cotyledon to seedling parts as affected by the effluent in the experimental conditions.From 3rd to 7th day of seed germination, as the dry weight of radicle and hypocotyl increases. It is paralleled by decrease in dry weight of cotyledon in control as well as in the other sets of distillery effluent irrigated sets in dark.

The seedling growth is promoted at lower concentrations and inhibited at higher concentrations of distillery effluent. However, the inhibitory effect is seen more in 10 % distillery effluent.

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