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Total reducing sugar content analysis in green gram (Vigna Radiata)

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Abstract
In normal agricultural practice, pollutants are applied by irrigation channel have waste chemicals, which interfere with growth with polluted water lead to deceptive pollution problem. To ensure their effect of different concentration of dye monastral fast blue & rhizobium species inoculant on reducing sugar in green gram (Vigna Radiata). The effect of dye and Rhizobium sp. On reducing sugar content of green gram was found to be stimulatory with all concentration. The total reducing sugars in the primary leaves of the control and the treated plant increased gradually upto 30 days after seed germination. The treatment of the higher concentration of the dye and rhizobium inoculant reduced the supply of the reducing sugar.

Keywords: Pollutants, Vigna Rediata, Rhizobium Inoculant & Dye

Introduction
Our country, India is based on agricultural products. These products are gained though intensive farming. Intensive farming needs sufficient energy, which is provided through fertilizers, growth regulators etc. The dyes, produced from the dye industries flown as wastes into the fields through irrigation channels, are also a form of energy but they have a negative impact on the cultivation. They show toxic effects on both flora & fauna and thereby reduce the productivity of the crops causing socio-economic problems. Along with agriculture India has its place amongst 10 most industrially developed countries of the world? Rapid industrazation has dramatically affected the upper stratosphere and seasonal climate all over the world. Exploitation of water resources and their use have been of primary importance from the early dawn of human resolution. It has brought in global interest in improving technologies for planning and uses of water resources. Many parts of the world are experiences acute water shortage and thus have brought and increased awareness about the vital importance of water as a natural resource. The effects of the dye and Rhizobium inoculant on crop productivity measured in term of average dry weight of seeds number of seeds/pod dry weight of plant, total reducing sugar content in seeds, total nitrogen and total protein content in seeds showed that each parameter was affected in similar way. Low concentration of the dye and Rhizobium inoculant had no significant effect over control, while higher concentration had inhibitory effects.Several studies have been conducted on various aspects of the green gram (vigna radiata), few attempts have been made to explore that how the total reducing sugar content analysis in green gram (vigna radiata)

Aim
Effect of different concentration of dye monstral fast blue & rhizobium sp. inculat on reducing sugar in green gram (Vigna Rediata).

Objectives
- To effect of different concentrations of dye monstral fast blue and *Rhizobium*sp. Inoculants on total reducing sugar.
- To evaluate the different concentrations of dye monstral fast blue and *Rhizobium* inoculants on reducing sugar.

Material & Methods
Area of study: The study was carried out at a department of botany, town Degree College, Ballia, Uttar Pradesh. The experiment was carried out with replication in factorial completely randomized block design. Ten plants were selected randomly at maturity from each plot for recording pods/plant, seeds/pod and 100-seed weight, whereas yield was recorded on net plot basis.
Total Reducing Sugars: For Estimation of Reducing sugars, in fresh (germinating seeds) and dry leaf a sample of the methods of Simonyi (1955) as described below was followed:

a. **Preparation of Aliquot:** Five hundred mili grams of seeds endosperm/embryo/leaf were crushed in 20 ml distilled water and the homogenate was then centrifuged for 10 min at 10000 rpm. To clear the supernatant a small pinch of activated charcoal was added before centrifugation.

Reagents
(I) Nelson's areseno molybdate reagent: It consists of two solutions prepared as follows
Solution A: Twenty five grams ammonium molybdate were dissolved in 450 ml of distilled water. To this 21 ml of concentration H_2SO_4 was added and mixed.
Solution B: Three grams of sodium arsenate were dissolved in 25 ml of distilled water.
(II) Somogiy's Reagent: It consists of two solutions which were prepared as follows:
Solution A: Twenty four grams of sodium carbonate, 16 g sodium bicarbonate, 12 g sodium potassium tortate and 140

g of sodium sulphate were dissolved in 800 ml of distilled water singly on after another.

Solution B: Four grams of cupric sulphate and 40 g of sodium sulphate were dissolved in 200 ml water. Solution a & B were combined in the ratio of 4:1 (Vol/Vol), just before use and were thoroughly mixed.

Estimation of Reducing Sugars: To 2 ml. aliquot in test tube, 2 ml Somogyi's reagent was added. Each test tube was heated for 10 min water-bath and was then cooled for 5 min in a cold water. Two ml of Nelson'saresenomolybdate reagent was then added to each test tube. After Mixing, the absorbency of the reaction mixture was measured in a spectrocolorimeter at 450 nm, using a blank. A calibration curve established with glucose was used to convert the colorimetric reading into milligrams of glucose and is expressed as mg/g fresh or dry weight of sample.

Statistical Analysis: Validity of the whole data was checked by running the validation programmed prepared by the investigator himself for this data set as well as manual crosschecking as needed. The EXCEL data sheet was exported then to SPSS trial version 16.0 and the grouping of values was made into meaningful, dichotomous, nominal or ordinal categories following the scientific logic and accordingly these were numerically coded. ANOVA was used for pair wise comparison. The minimum acceptable confidence level was 95% for all statistics and the maximum acceptable significance level was $p<0.005$.

Results & Discussion

Table 1: Effect of different concentrations of dye monastral fast blue and Rhizobium inoculant on reducing sugar of vigna radiata in term of mg\gm free wt

Concentration (%) V/V (X)	Hours After Treatment				C	Mean	C^2
	24	48	72	96			
Control	0	8.2	9.6	12.01	29.8	7.45	888.04
25	0	8.0	9.5	11.9	29.4	7.35	864.36
50	0	7.2	7.8	9.0	24.0	6.0	576.0
75	0	6.3	7.0	8.8	22.1	5.52	488.41
100	0	5.5	6.0	7.2	18.7	4.67	349.69
T	0	35.2	39.9	48.9	124.0		ΣC^2
Mean	0	7.04	7.98	9.78	ΣT^2		3166.50
T^2	0	1239.04	1592.01	2391.21	5222.26		
Σy^2 CF= TSS= SST= SSC= SSE= 752.8242 524.65 220.6652 186.8246 22.5648 11.9864							

Table 2: ANOVT

S.S due to	D.F.	S.S	M.S	F
Time	3	186.8246	102.2256	F1=7752.6242
Concentration	4	22.5648	0.2086	F2=8.98320
Error	12	11.9864	0.1006	
Total	19	221.3758		
CD (Time) = 0.1240 CD (Conc.) = 0.1024				

The effect of dye and rhizobium species on reducing sugar content of green gram was found to be stimulatory with all concentration. The stimulatory effect in all the treatment continued upto 96 hours. However the effect of lower concentration of 25% (i.e. 8.0 to 11.9 gm/gm fresh wt.) Which was similar to those of control was found more stimulatory than concentration of 100% (i.e 5.5 to 7.2 mg/g fresh wt. between 48 to 96hrs). However lower concentration except 25% has less stimulating effect in comparison to control. (Table-01& 02)

Table 3: Effect of different concentrations of dye monastral fast blue and rhizobium species inoculants on total reducing sugar in primary leaves of vigna radiata measured as mg/g fresh weight of leaves.

Concentration % V/V	Days After Seed Germination								C	Mean	C^2
	7	10	13	16	19	22	26	30			
Control	74.12	78.54	82.86	88.24	92.58	97.24	101.34	105.84	720.76	90.09	519494.98
25	73.52	78.52	81.67	88.20	90.82	97.12	101.28	104.35	695.48	86.94	483692.43
50	68.32	74.32	78.52	82.92	86.22	92.48	98.24	98.65	681.67	85.21	464673.98
75	64.12	71,12	72.82	78.62	81.64	88.26	93.42	92.82	652.82	81.60	426173.95
100	57.24	67.20	67.84	75.25	77.48	83.48	88.24	88.52	605.25	75.65	366327.56
T	337.32	359.70	403.71	413.23	428.74	485.58	482.32	490.18	3355.99		2260262.90
Mean	67.46	71.94	80.74	82.65	85.75	91.72	96.46	98.04			
T^2	113784.78	129384.09	162981.76	170759.03	183117.98	210295.62	232632.58	240276.43			
$\Sigma y2$ CF= TSS= SSC= SST= SSE= $\Sigma T2$= 251442.326 235846.325 8964.56 4642.52 6218.32 5.93 1443232.27											

Table 4: ANOVT

SS. Due To	D.F.	S.S.	M.S.	F
Concentration	3	4682.52	1862.72	F_1 =5424.26^0
Day	7	6218.32	862.42	F_2 =3204.22^0
Error	21	5.93	0.82	
Total	31	10906.77		
CD (Conc.) = 0.56 CD (Day) = 0.72				

The total reducing sugars in the primary leaves of the control and the treated plant increased gradually upto 30 days after seed germination. The treatment of leaves with lowest concentration of the dyes and rhizobium species inoculants (25% v/v) caused no significant effect in the reducing sugar over control which was found to be 73-52 to 104.35 mg/g fresh wt. of leaves between 7 to 30 days treatment of higher concentration (50, 75 and 100% v/v) caused significant decrease in total reducing sugars. (Table-03 & 04)

Conclusion

Changes in the total reducing sugar in leaves are two indicators of the changes induces by the pollutants. The result of the present investigations shows that treatment of dye and rhizobium inoculants on total reducing sugar were similarly treatments of lower concentration of the dye & rhizobium inoculants had no significant effect on the total reducing sugar over control. Whereas the higher concentration had shows inhibitory effects. From the present study, it may also concluded that treatments of lower concentration of dye and rhizobium inoculants had no significant effect on photosynthesis over control, but higher concentration inhibited it because of the production of reduced amount of sugars.

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