

Results

Growth of different Phytoplankton after one month of application of different fertilisers along with the ANOVA test of data are tabulated in table 1 to 8.

While table 1 shows the growth class wise, table 2-7 shows the same genus wise.

The growth rates were different for different genus of phytoplankton. ANOVA test was done to find out if the significance of differential growth on application of different fertilisers. On the basis of ANOVA test, it can be deduced that there is significance difference in growth on application of different fertilisers.

The growth was found to be highest on application of combination of NPK and mustard cake (131% growth over normal pot). Next was found to be mustard cake (74%) and lowest growth was observed on application of NPK alone (26%) (Table 1 & fig 1.3). Among different classes the growth was found to be maximum in Chlorophyceae (table 1, fig 1.1) and lowest in Rhodophyceae.

Percentage increase in Chlorophyll a was also found to be highest in the pot with NPK + mustard cake (89%) followed by only mustard cake (47%) and only NPK (16%).

Seven different genera of phytoplankton were found in our analysis. Out of them, *Anabaena*, *Gomphosphaeria* and *Aphanocapsa* are blue green algae (cyanobacteria). *Chlorella* and *Haematococcus* are chlorophyceae. *Rhodomonas* is red algae and *Pleurosigma* is diatom. Phytoplankton growth was also observed in these genera. The recorded data are tabulated from table 2 to table 8. In this study also, it was found that the growth was maximum on application



Phytoplankton



Pot with phytoplankton

of NPK + mustard cake combination followed by only mustard cake and only NPK. The significance of the results were checked by ANOVA test using Microsoft excel and the results were found to be significant.

Physicochemical properties of water in the pots were recorded. The properties recorded are evening temperature, morning temperature, pH level, turbidity, transparency and dissolved oxygen. These have been tabulated in Table 9.

Table 1 : Growth of Phytoplankton

Parameter	Phytoplankton class	POT A		POT B		POT C		POT D
		Growth % in comparison with control						
		Count (No)	Growth	Count (No)	Growth %	Count (No)	Growth %	Count (No)
Abundance	Cyanophyceae	67	25%	88	64%	115	114%	54
	Chlorophyceae	102	26%	142	75%	191	136%	81
	Bacillariophyceae	30	22%	44	81%	58	140%	24
	Rhodophyceae	27	31%	40	92%	51	145%	21
	Total	226	26%	313	74%	415	131%	180
Chlorophyll a (µgm/l)		325	16%	411	47%	530	89%	280

Fig 1.1 Growth of Phytoplankton

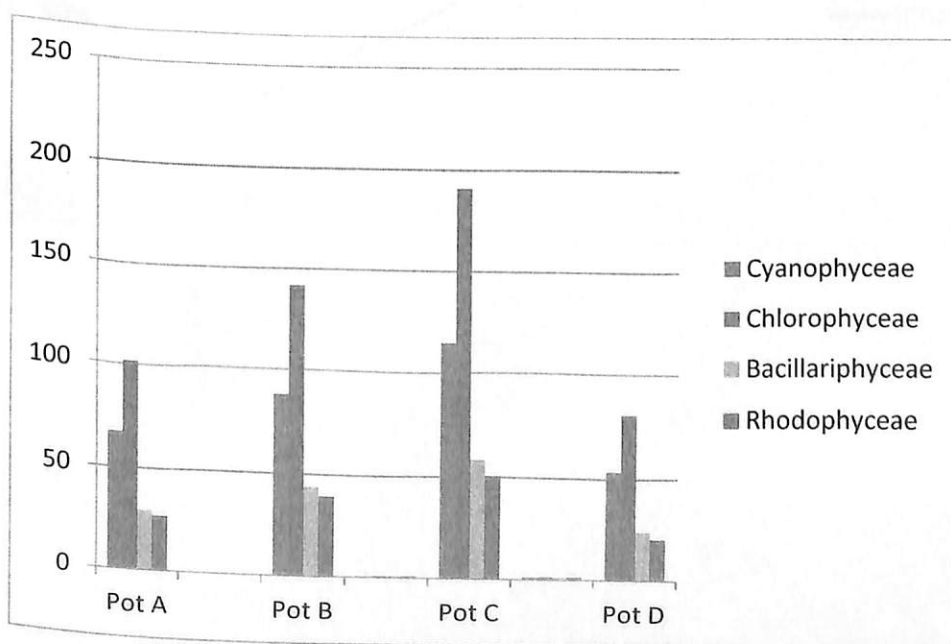


Fig 1.2

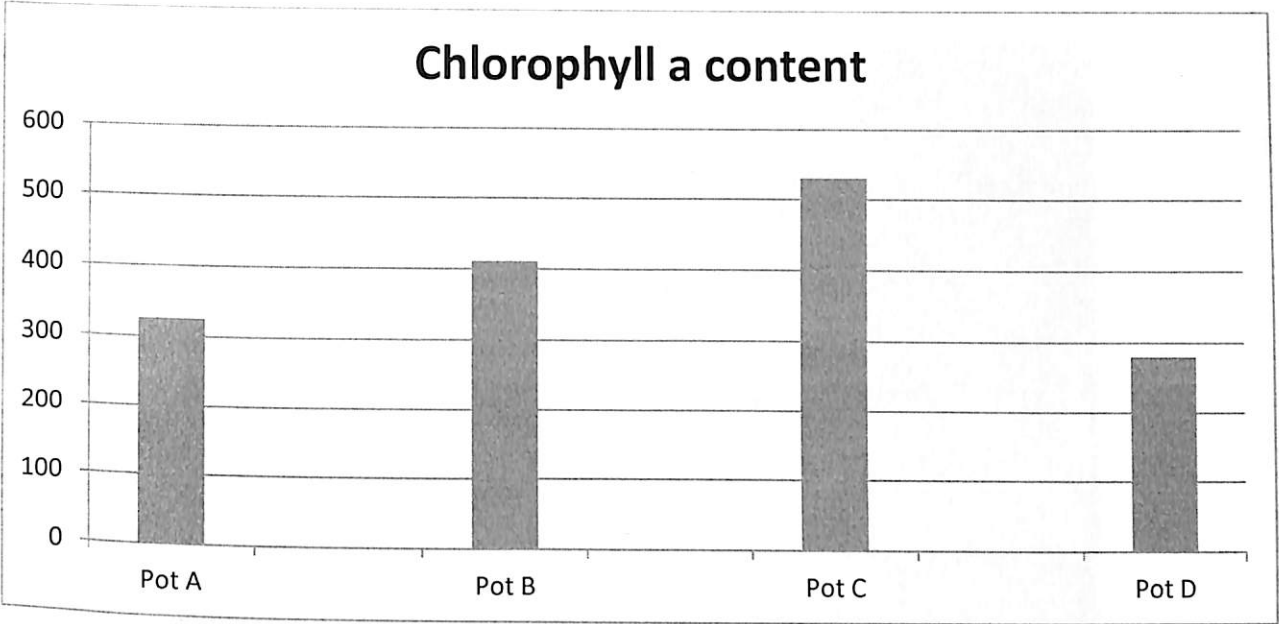
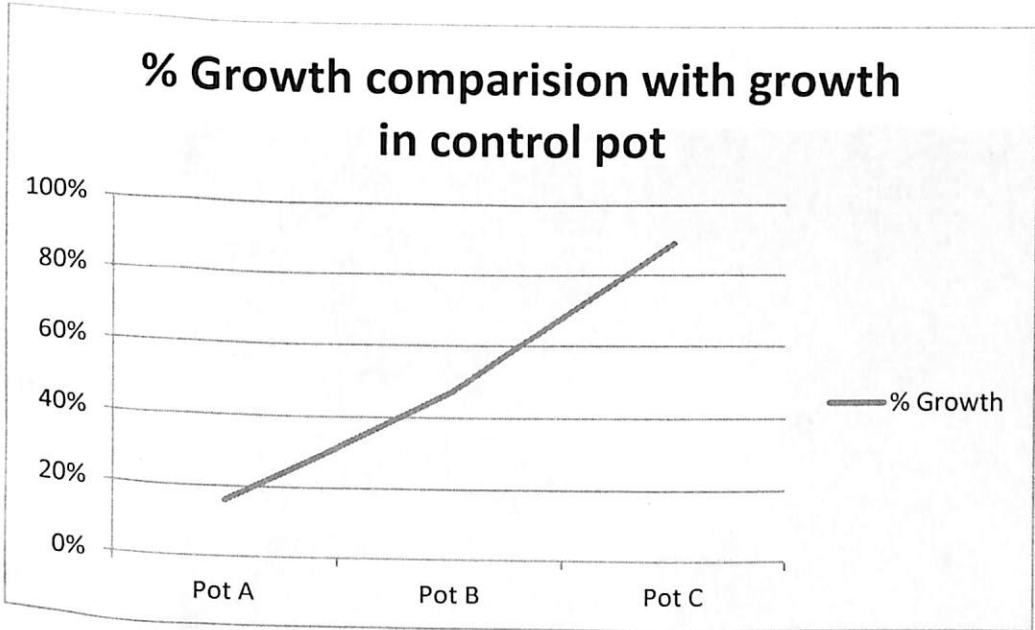
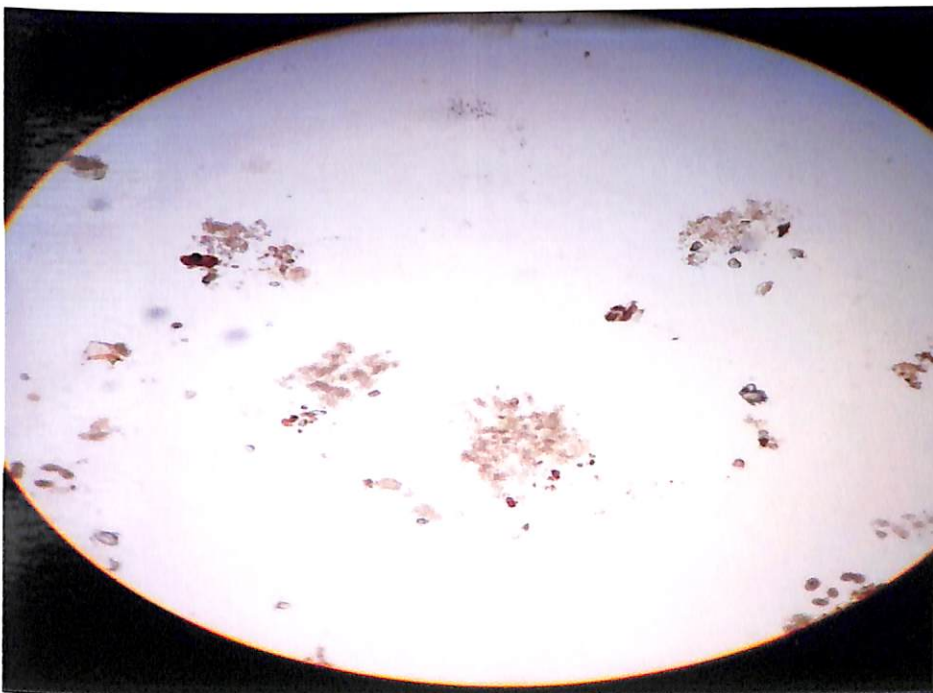


Fig 1.3

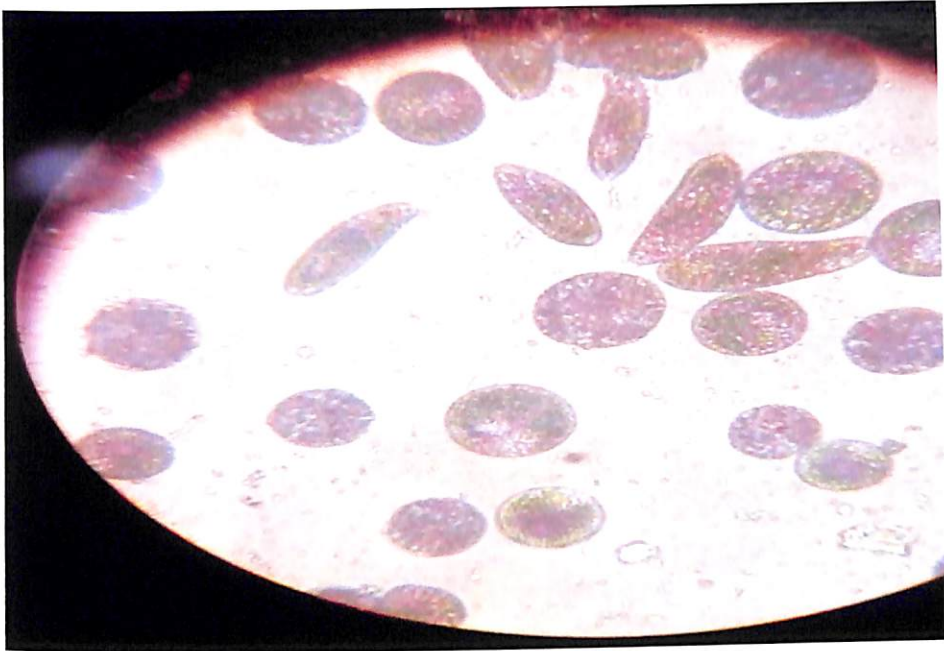




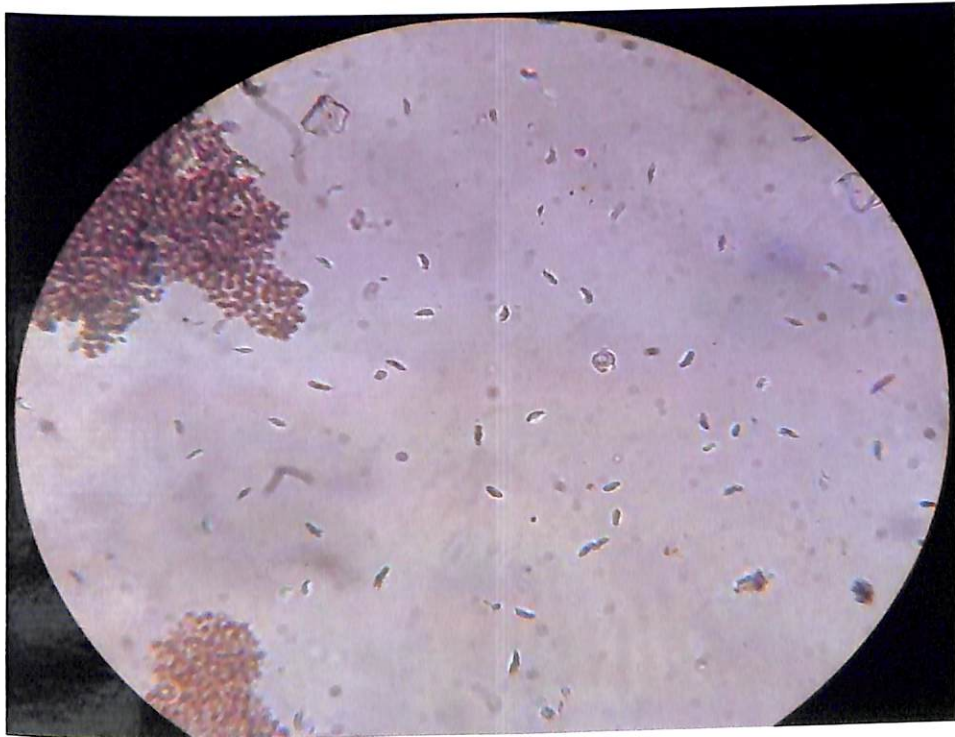
Anabaena



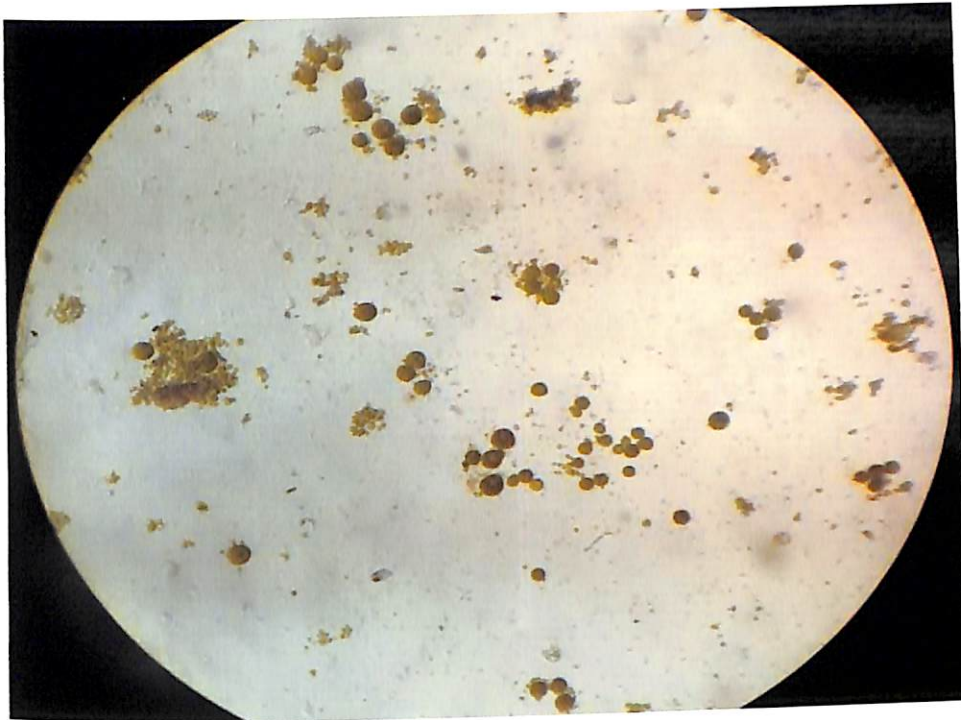
Aphanocapsa



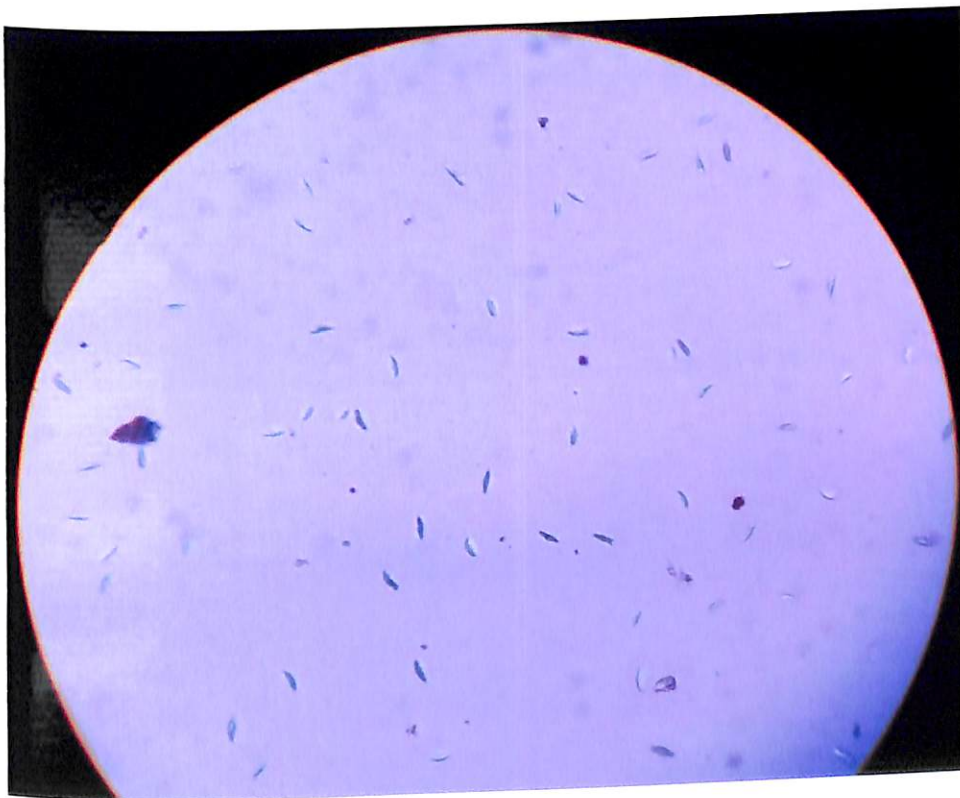
Chlorella



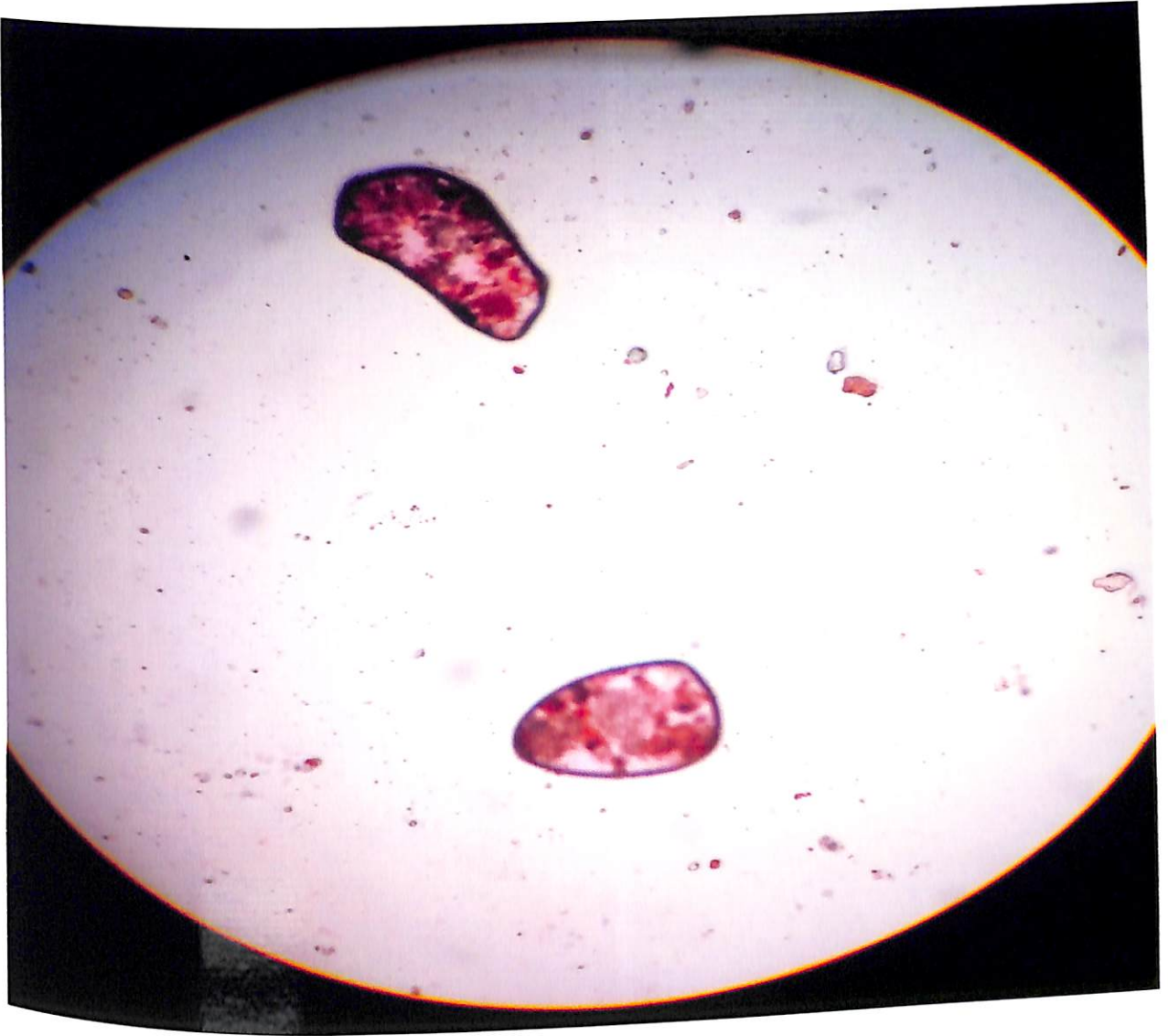
Gomphosphaeria



Haematococcus



Pleurosigma



Rhodomonas

Table 2 : Anova test of Anabaena growth

Genus : Anabaena						
		Fertiliser Applied				
Sample	POT A	POT B	POT C	POT D		
1	20	24	30	12		
2	22	24	28	13		
3	20	25	33	15		
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
Column 1	3	62	20.66667	1.333333		
Column 2	3	73	24.33333	0.333333		
Column 3	3	91	30.33333	6.333333		
Column 4	3	40	13.33333	2.333333		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	455	3	151.6667	58.70968	8.62E-06	4.066181
Within Groups	20.66667	8	2.583333			
Total	475.6667	11				

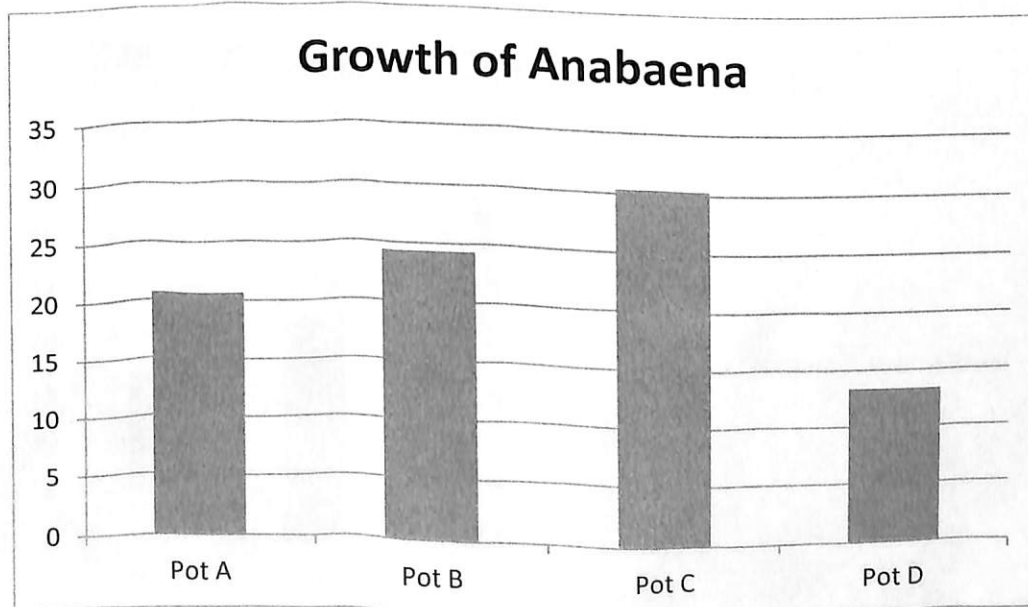


Table 3 : Anova test of Gomphosphaeria growth

Genus : Woronichini						
	Fertiliser Applied					
Sample	POT A	POT B	POT C	POT D		
1	15	20	35	15		
2	14	22	37	18		
3	17	24	30	14		
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
Column 1	3	46	15.33333	2.333333		
Column 2	3	66	22	4		
Column 3	3	102	34	13		
Column 4	3	47	15.66667	4.333333		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	684.9167	3	228.3056	38.58685	4.18E-05	4.066181
Within Groups	47.33333	8	5.916667			
Total	732.25	11				

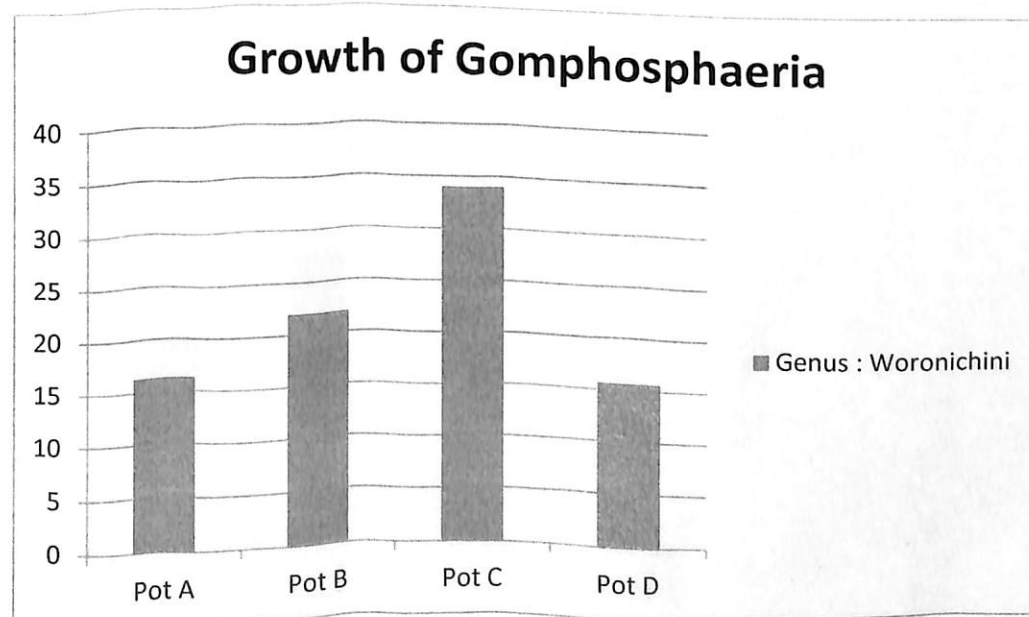


Table 4 : ANOVA test of Aphanocapsa growth

Genus : Aphanocapsa						
	Fertiliser Applied					
Sample	POT A	POT B	POT C	POT D		
1	25	42	51	31		
2	27	45	52	32		
3	22	38	48	28		
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
Column 1	3	74	24.66667	6.333333		
Column 2	3	125	41.66667	12.33333		
Column 3	3	151	50.33333	4.333333		
Column 4	3	91	30.33333	4.333333		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1187.583	3	395.8611	57.93089	9.07E-06	4.066181
Within Groups	54.66667	8	6.833333			
Total	1242.25	11				

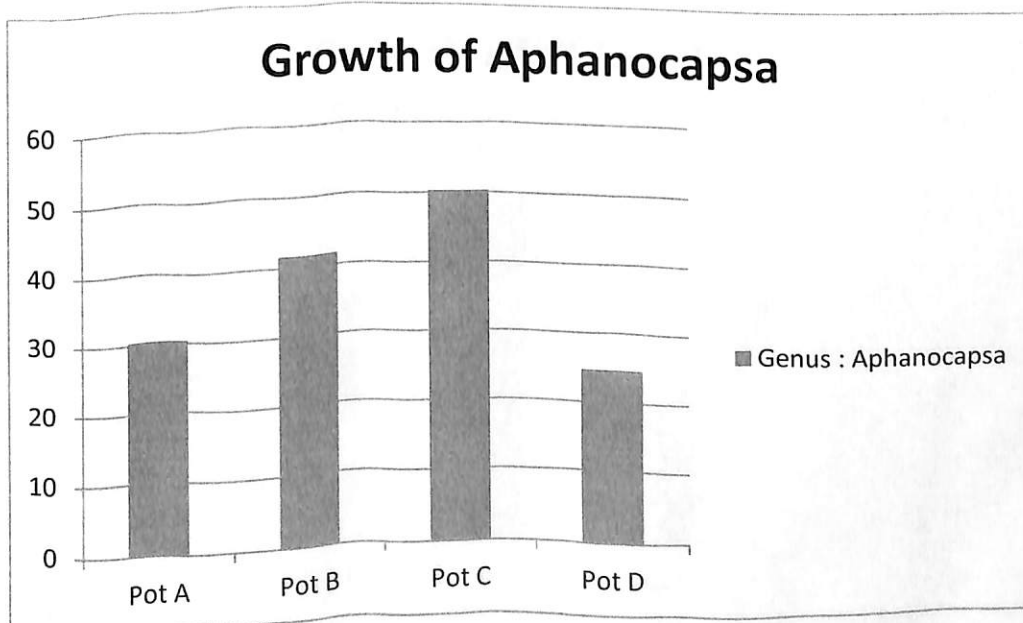


Table 5 : Anova test of Chlorella growth

Genus : Chlorella						
		Fertiliser Applied				
Sample	POT A	POT B	POT C	POT D		
1	31	34	49	22		
2	30	36	48	25		
3	28	37	52	23		
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
Column 1	3	89	29.66667	2.333333		
Column 2	3	107	35.66667	2.333333		
Column 3	3	149	49.66667	4.333333		
Column 4	3	70	23.33333	2.333333		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1138.25	3	379.4167	133.9118	3.55E-07	4.066181
Within Groups	22.66667	8	2.833333			
Total	1160.917	11				

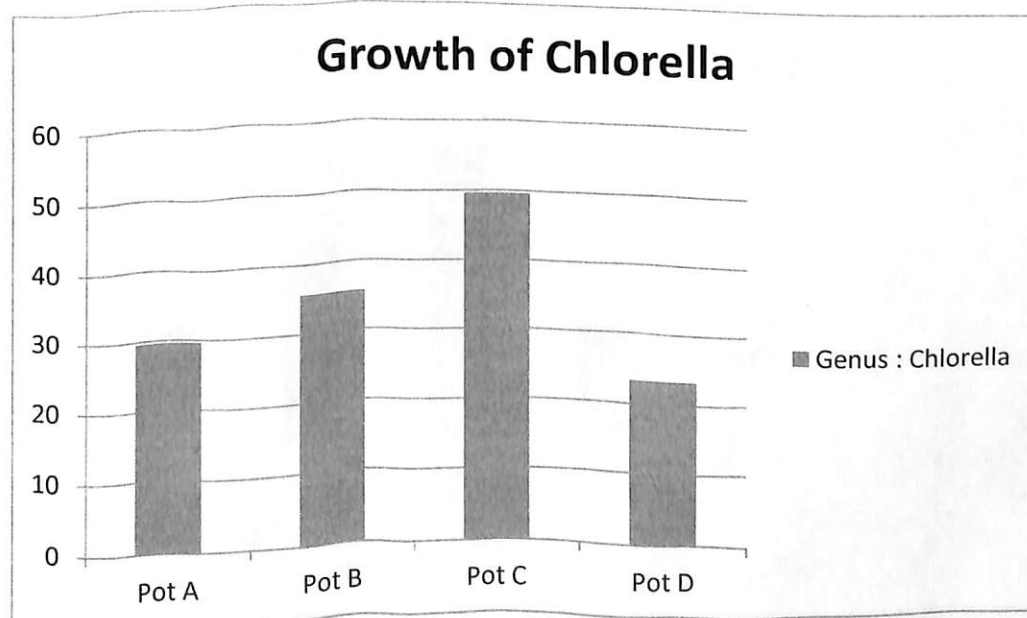


Table 6 : ANOVA test of Haematococcus growth

Genus : Haematococcus						
	Fertiliser Applied					
Sample	POT A	POT B	POT C	POT D		
1	15	21	32	11		
2	14	22	35	14		
3	17	24	30	13		
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
Column 1	3	46	15.33333	2.333333		
Column 2	3	67	22.33333	2.333333		
Column 3	3	97	32.33333	6.333333		
Column 4	3	38	12.66667	2.333333		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	694	3	231.3333	69.4	4.54E-06	4.066181
Within Groups	26.66667	8	3.333333			
Total	720.6667	11				

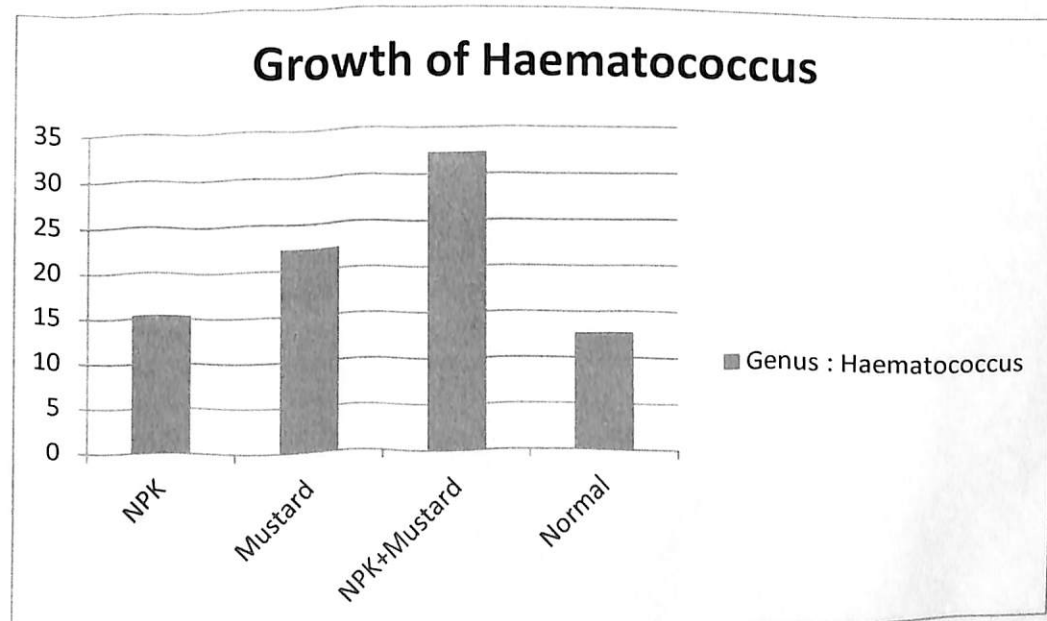


Table 7 : ANOVA test of Rhodomonas growth

Genus : Rhodomonas						
	Fertiliser Applied					
Sample	POT A	POT B	POT C	POT D		
1	26	41	46	21		
2	27	40	47	22		
3	28	38	59	19		
Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
Column 1	3	81	27	1		
Column 2	3	119	39.66667	2.333333		
Column 3	3	152	50.66667	52.33333		
Column 4	3	62	20.66667	2.333333		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1607	3	535.6667	36.94253	4.92E-05	4.066181
Within Groups	116	8	14.5			
Total	1723	11				

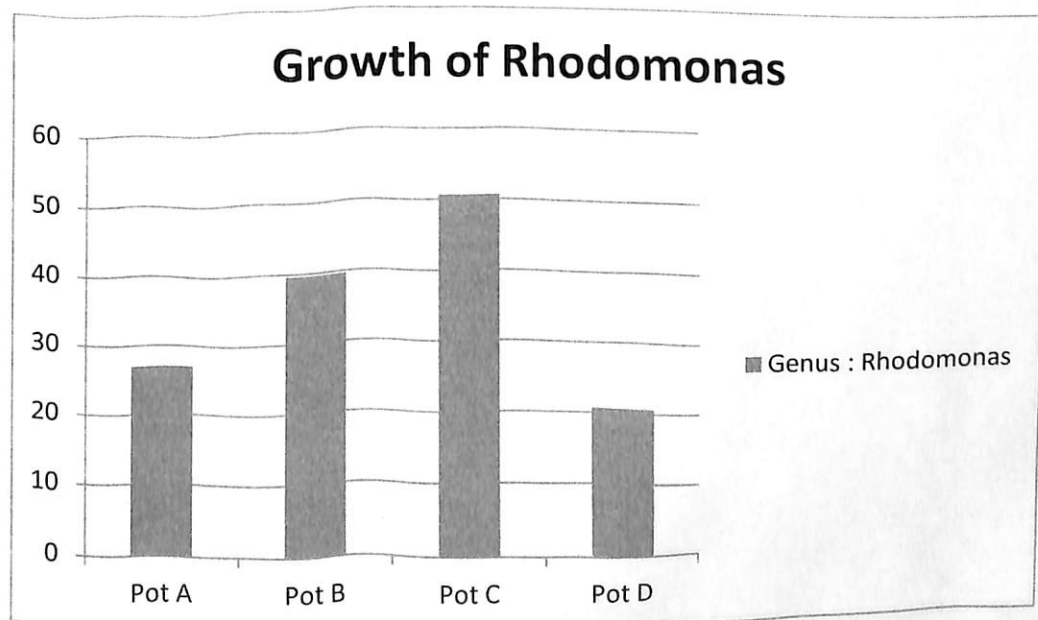


Table 8 : Anova test of Pleurosigma growth

Genus : Pleurosigma							
	Fertiliser Applied						
Sample	POT A	POT B	POT C	POT D			
1	30	44	59	22			
2	31	43	55	24			
3	28	45	61	27			
Anova: Single Factor							
SUMMARY							
Groups	Count	Sum	Average	Variance			
Column 1	3	89	29.66667	2.333333			
Column 2	3	132	44	1			
Column 3	3	175	58.33333	9.333333			
Column 4	3	73	24.33333	6.333333			
ANOVA							
Source of Variation	SS	df	MS	F	P-value	F crit	
Between Groups	2102.917	3	700.9722	147.5731	2.43E-07	4.066181	
Within Groups	38	8	4.75				
Total	2140.917	11					

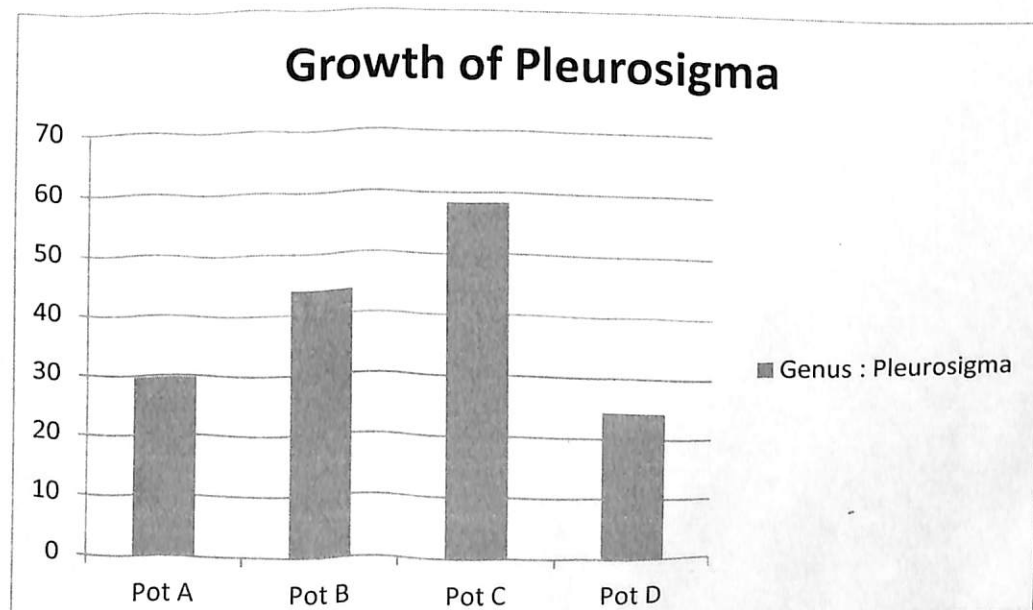


Table 9 : Physicochemical Properties of water

Physicochemical Parameter	A	B	C	D
Morning Temperature (°C)	25.20±0.03 to 25±0.00	25.25±0.04 to 25.50±0.05	25.20±0.00 to 25.50±0.02	25.40±0.04 to 25.80±0.05
Evening Temperature (°C)	26.20±0.03 to 26.35±0.03	26.15±0.05 to 25.55±0.04	25.10±0.06 to 25.55±0.01	26.10±0.00 to 25.50±0.06
pH Level	6.80±0.10 to 7.10±0.08	6.60±0.12 to 7.80±0.10	6.30±0.20 to 7.40±0.04	7.11±0.03 to 7.00±0.1
Turbidity (mg/l)	1.00±0.30 to 35.20±0.14	1.5±0.0 to 40.70±0.087	1.7±0.00 to 45.8±1.55	0.01±0.00 to 1.00±0.0
Transperancy (cm)	1.0±0.30 to 50.20±0.1	.5±3.4 to 91.20±0.085	100±3.2 to 240±4.88	1.0±0.06 to 2.2±0.20
Dissolved Oxygen (mg/l)	5.5±0.12 to 7.5±0.1	3.6±0.10 to 5.20±0.22	3.01±0.05 to 6.5±0.06	5.5±0.02 to 8.4±0.02