J. Phytol. Res. 6 (1 & 2):81-82, 1993

SEASONAL VARIATION IN PHYTOPLANKTONIC BIOMASS AND PRODUCTIVITY OF A VILLAGE TANK

S.S. SREENIVAS
S.T.R.I. Research Station, Hunsur, 571105, India

The primary productivity and phytoplanktonic biomass showed a seasonal variation. The decrease in the quantum of phytoplanktonic biomass at instances did not show any influence on the per hour carbon assimilation rates suggesting light adaptation, a physiological change by algae but is influenced by other factors.

Keywords : Phytoplankton; Productivity; Pigment content.

Water bodies that are receiving pollutants increase their productivity resulting in serious biotic changes. This increased fertility has many implications over water quality and hygiene of the environs around. In the present study a perennial water body located at about 40 kms away from Anand (Gujarat) was investigated for complete one year during 1988-89. Primary productivity which forms a potential index for many diverse ecosystems was investigated.[1] An attempt was made to compare chlorophyll -a content which forms an inveterate index of standing crop of the phytoplankton with productivity.

The present investigation was carried out on monthly intervals for about one year. The primary productivity was measured using light and dark bottle method.[2] Dissolved oxygen was measured following modified winklers method.[3] Based on the Oxygen value obtained Carbon value, $gCm^{-3}h^{-1}$ was calculated by multiplying with the factor 0.375.[4] Chlorophyll-a content of the phytoplankton was obtained by filtering 1 litre water samples.

The gross primary productivity and phytoplanktonic biomass showed a marked seasonal change (Table 1). The productivity varied from 0.284 to 0.884; 0.304 to 0.837 $gCm^{-3}h^{-1}$, at surface waters and 0.247 to 0.796; 0.253 to 0.812 $gCm^{-3}h^{-1}$ at sub-surface waters at Stations I and II respectively. Productivity recorded more in the surface water than in sub-surface waters at both the stations. The pigment chl-a recorded a maximum of 231.12; 212.21 and a minimum of 85.31; 61.21 mg m^{-3} at stations I and II respectively. The months where chl-a recorded more or less same, the per hour carbon assimilation rates varied with temperature and light.

The high productivity and phytoplanktonic biomass during summer months may be due to bright sunshine, high temperatures, high density of algal blooms.[5] The low values recorded during monsoon may be attributed to

Table 1. Monthly values of primary productivity (GPP) and Chl-a of Gomti tank (1988-89)

1988-89	GPP				Chl-a	
	Station I		Station II		Station I	Station II
Month	Surface	Sub-surface	Surface	Sub-surface		
May	0.679	0.663	0.746	0.644	191.14	161.31
June	0.884	0.796	0.837	0.812	231.12	212.21
July	0.291	0.265	0.307	0.287	195.17	175.18
August	0.284	0.247	0.304	0.258	151.31	131.21
September	0.322	0.260	0.340	0.253	132.21	156.16
October	0.348	0.294	0.335	0.293	95.16	130.21
November	0.345	0.311	0.346	0.313	85.31	86.21
December	0.336	0.310	0.335	0.306	95.21	92.18
January	0.334	0.232	0.341	0.293	95.16	61.21
February	0.493	0.465	0.491	0.440	96.31	82.16
March	0.545	0.446	0.521	0.484	145.14	132.12
April	0.553	0.487	0.531	0.468	166.31	146.14

GPP = $gCm^{-3}h^{-1}$ Chl-a = mg m^{-3}

sudden influx of water, dilution of nutrients, low transperancy and decreased sunlight. The enhanced levels in the productivity compared to low fluctuations in chl-a content may be attributed to light adaptation by algae. Furthermore, pigment content of algae, depends on variation in taxonomic composition of phytoplanktonic community and this in turn depends on nutrient availability, light intensity and temperatures.

The author is thankful to C.S.I.R., New Delhi for financial assistance.

References

1. Wetzel R G 1980, *Int. Wetlands Conf. New Delhi.* (Abst.) **17** 16

2. Gaarder T and Gran H H 1927, *Proc Verb. Reve Counseil Perum Intern Exploration Scient Mer Medatarr* **42** 1

3. APHA 1975, *American Pub. Health. Inc., New York.*

4. Westlake D G 1963, *Biol. Rev.* **58** 385

5. Adoni A D and Vaishya A K 1985, *Proc. Nat. Symp. Pure and Appl. Limol. Bull. Bot. Soc. Sagar* **32** 219