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ORIGINAL ARTICLE

Assessment of Nitrogen Components, Sulphatesandphosphates in River Asan in District Murena

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ABSTRACT

Water pollution is a serious threat to life. A river is said to be polluted when the water in it is altered in composition directly or indirectly as a result of man's activities. The discharge of solid or liquid waste products grouped under sewage, industrial and agricultural caused water pollution. The effluents containing inorganic and organic chemicals which are toxic to plants, animals and human beings. The toxins are absorbed into the tissue from the polluted water and the affect produced various with the type of chemical and the metabolism of the organism.

Key word: *Nitrogen Components, Sulphatesandphosphates, River Asan*

INTRODUCTION

Today the cry of pollution is heard from all the nooks and corners on global level. It has become a major challenge and threat to the very existence of mankind on the earth. It is due to the increasing industrialization and other rapid developmental activities. According to Indian Mythology nature is a combination of five elements i.e. Kshiti, Sameera, Jal, Agni and Gagan. As per this statement life needs all these elements. Water is also very important for survival of life. Water is a basic necessity for living beings because without water various living beings mechanical and physico-chemical activities cannot sustain on this planet. India being a large country having varied agro-climatic conditions and is bestowed with a vast expense of inland water in the form of rivers, canals, estuaries, lagoons, natural lakes, brackish water, impoundment, mangroves, wetlands and above all reservoirs constituting the bedrock of inland fisheries. Large dams are increasingly becoming characteristic components of our river basins. Man made rivers which are created primarily for the purpose of irrigation, power generation, drinking water, flood control and industrial uses. Rivers are naturally formed through hollow or depression on the surface of earth, which get filled with water and are of diverse geological region. Surface elevations of virtually all rivers are subjected to variations from season to season and from year to year. An increase in the shallowness of the ecosystem is likely to increase the productive conditions, however may have the opposite effects. Unusual fall in water level sometimes exposes short area, thus eliminating rooted vegetation zones and temporarily robbing the rivers of its most productive regions. The greatest diversity prevails in the bottom of the different kinds of rivers as well as in the individual rivers of the same type. Every river accumulates deposits on its bottom. The kinds of bottom deposits and rate of deposition are largely depending upon local circumstances, likewise distribution of materials once they are in the river, also depends upon local conditions. Due to various industrial revolution atmosphere getting polluted by various sources. History of civilization is as old as the man's knowledge of fire and tools techniques to alter his environment, but its impact on environment has never being so brave as during presented days. The increasing population, galloping technology and economic development have created awareness of environment crisis and need for balancing the nature. It is must that man must start to think in harmony with the nature seems to be a dream. The main object is to safe guard air, water and land without which life is not sustaining.

MATERIALS AND METHODS

Water sampling sites from river Asan at Murena after each 3 months sample were collected at the each sampling stations at different times for the analysis of different parameters. Samples were collected in the middle of streams and at mid-depth in the direction of flow. Samples storage a low temperature (4 degree centigrade).

STUDY SITES:

1. ChandaGaon
2. JaroniGaon
3. KaruaGaon
4. GirgoniGaon

WATER SAMPLING COLLECTION:

Sampling was done significantly after each three months intervals for 1 year. The water samples of river asan were collected. From all the sampling points October 2010 to July 2011 for the study of water quality. Samples from the river water were collected in five litresprecleaned plastic bottles for physico-chemical analysis. One glass bottle (DO. bottle capacity 300 ml.) was filled with water at every sample point for the estimation of dissolved oxygen as referred by APHA (1992). Sample for MPN (Coliform and Faecal bacteria or Coliform) detection were collected in sterilized glass bottle and preserved in ice (APHA, 1992) water temperature was determined at the sampling point while other parameters were analysed in the laboratory.

NITROGEN (TOTAL AMMONIA AND NITRATE):

Ammonia Nitrogen (Nesslerization Method):

Ammonia ion reacts with Nessler's reagent (K_2HgI_4) to form brown colour substances and can be determination of colourimetrically. Most of the wastes have using substances therefore stream distilization of ammonia nitrogen.Taken 10 ml. solution in conical flask then add 1 drop EDTA reagent then add 1 ml. Nessler's reagent then mix it gently for 10 min., the orange colour developed.

Find out the concentration of NH_3 – N directly from the standard curve.

Nitrate Nitrogen (Brucine Method):

Nitrate and Brucine reacts to produce a yellow colour.Taken 10 ml. sample in Nessler's tube then add 1 ml. Brucinesulphate and 10 ml. acid reagent (125 ml. sulfuric acid + 500 ml. distilled water) then mixed by swirl and allowed to cool. Measured the absorbance of the sample and blank either with a spectrophotometer at a wave length of 410 nm. Read the concentration of Nitrate nitrogen directly from the calibration curve.

$$\text{Nitrate - Nitrogen (mg/l)} = \frac{\text{Vg Nitrate - Nitrogen}}{\text{ml. of sample}}$$

SULPHATE (TURBIDIMETRIC METHOD):

Sulphate ion is precipitated in the form of barium sulphate by adding barium chloride in hydrochloride acid (HCl). The concentration of the sulphate can be determined from the absorbance of the light by barium sulphate and then comparing it with a standard curve.Taken 50 ml. sample in a conical flask then add 25 ml. conditioning reagent (mix 50 ml. glycerol + 30 ml. conc. HCl + 50 ml. distilled water + 100 ml. 95% ethyl alcohol + 75 gm. NaCl) then stirred and add $BaCl_2$ crystal and again stirred continuously for 1 min. Measured the turbidity developed after 30 sec for 4 min on calorimeter at 420 mu. After 2 min stirring reading will remain constant.Prepaired standard curve by carrying standard sulphate solution through entire procedure space standard at 5 mg/l increment in the 0-40 mg/l range. Then read the sulphate present in the sample from the standard curve.

$$\text{Sulphate (mg/l)} = \frac{\text{mg Ba sulphate x 1000}}{\text{mg. sample}}$$

PHOSPHATE (STANNOUS CHLORIDE METHOD):

Taken 100 ml. sample and then add 1 drop phenolphthalkein indicator, the sample turns pink. Then add strong acid solution drop-wise to discharge the colour. Then add with mixing 4.0 ml.

molybdate reagent and 0.5 ml. (10 drops) stannous chloride reagent till blue colour developed.

RESULTS AND DISCUSSION

NITROGEN (TOTAL AMMONIA AND NITRATE):

AMMONIA NITROGEN: There was no significant variation in the ammonia nitrogen of Asan water at different four sampling stations. However, the ammonia nitrogen of Asan water varies significantly after each three months interval.

Table 1: Average Ammonia Nitrogen

Month	Ammonia nitrogen (mg/l)			
	Site A	Site B	Site C	Site D
Oct-10	0.23	0.24	0.26	0.21
Jan-11	0.81	0.83	0.86	0.80
April-11	2.00	2.01	2.11	1.98
July-11	1.19	1.20	1.23	1.17

NITRATE NITROGEN: There was no significant variation in the nitrate nitrogen of Asan water at different four sampling stations. However, the nitrate nitrogen of Asan water varies significantly after each three months interval.

Table 2: Average Nitrate Nitrogen

Month	Nitrate nitrogen (mg/l)			
	Site A	Site B	Site C	Site D
Oct-10	0.94	0.96	0.96	0.91
Jan-11	0.37	0.38	0.36	0.35
April-11	1.82	1.84	1.85	1.81
July-11	4.82	4.83	4.84	4.83

SULPHATE: There was no significant variation in the sulphate of Water of Asanriver at different four sampling stations. However, the sulphate of Water of Asanriver varies no significant after each three months interval.

Table 3: Average Sulphate

Month	Sulphate (mg/l)			
	Site A	Site B	Site C	Site D
Oct-10	17.44	24.32	21.15	33.05
Jan-11	19.00	25.05	21.18	26.25
April-11	24.09	21.15	22.46	26.52
July-11	18.00	21.00	21.15	28.92

PHOSPHATE: There was no significant variation in the Phosphate of water of Asanriver at different four sampling stations. However, the Phosphate of Water of Asanriver varies no significant after each three months interval.

Table 4: Average Phosphate

Month	Phosphate (mg/l)			
	Site A	Site B	Site C	Site D
Oct-10	0.38	0.43	0.63	0.81
Jan-11	0.40	0.47	0.61	0.85
April-11	0.47	0.48	0.53	0.82
July-11	0.49	0.52	0.52	0.79

Site A= ChandaGaon Site B= JaroniGaon Site C= KaruaGaon Site D= GirgoniGa

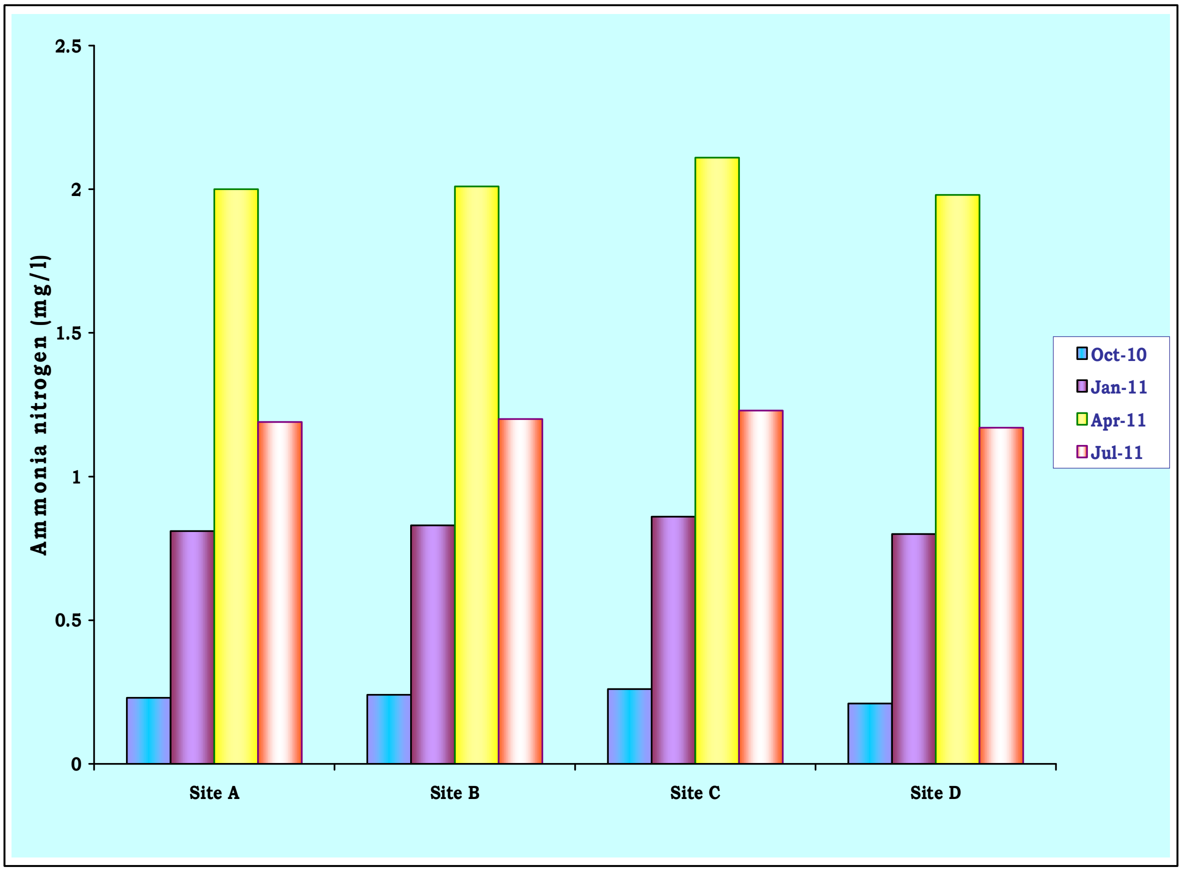

Fig. 1: Ammonia nitrogen in water sample at the four different stations at three months interval

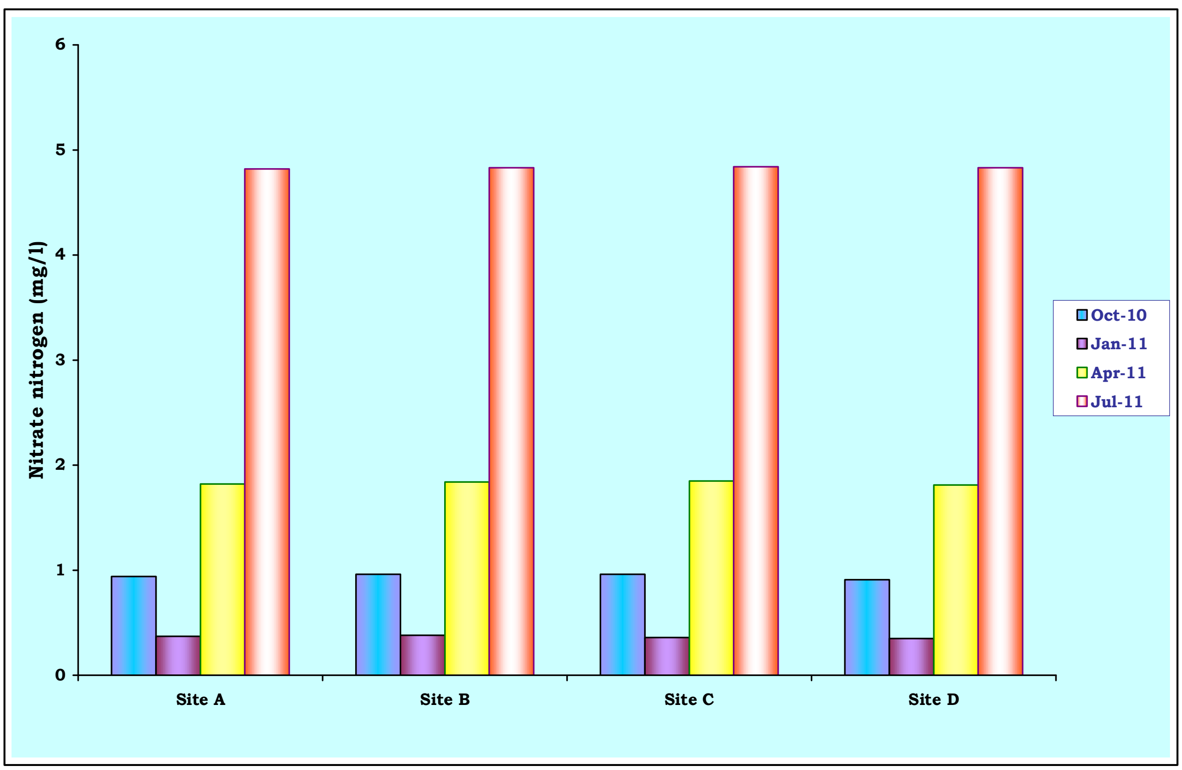

Fig. 2: Nitrate nitrogen in water sample at the four different stations at three months interval

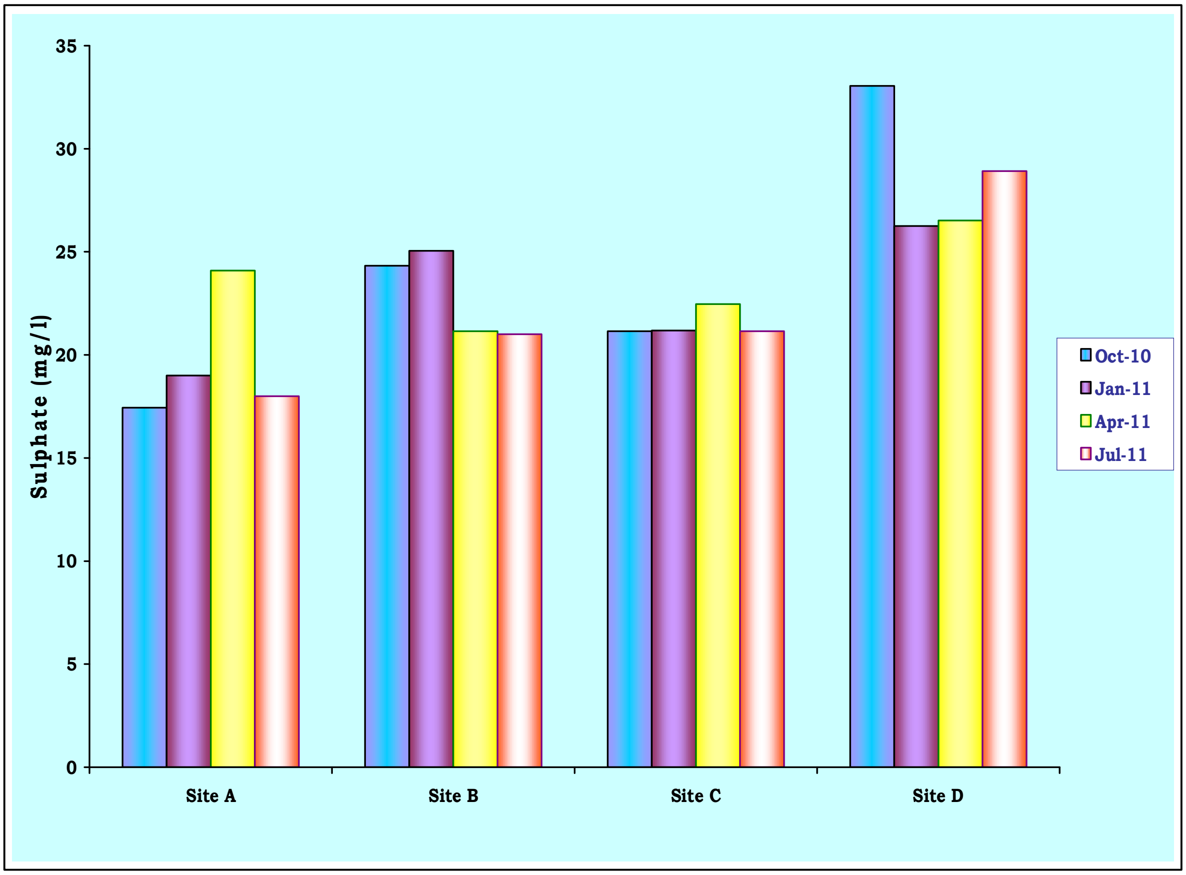

Fig. 3: Sulphates in water sample at the four different stations at three months interval

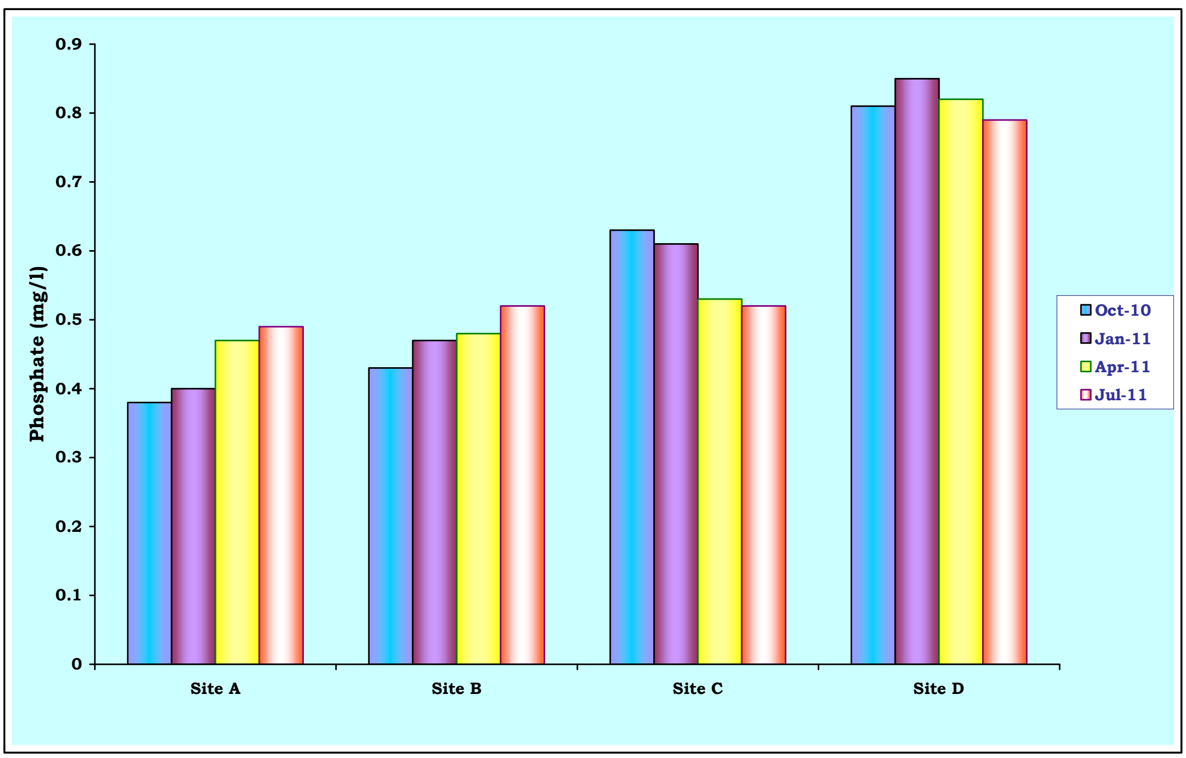

Fig. 4: Phosphate in water sample at the four different stations at three months interval

Nitrogen (total ammonia and nitrate) is very important parameter to assess the quality of any water body. In the present investigation data demonstrate that the values of nitrogen (ammonia nitrate) significantly both site study period at downstream site (D) as compared to upstream site (A). During Oct. 2010 to Jan. 2011 that is nitrate nitrogen and significantly both site study period at downstream site (D) as compared to upstream site (A) during April 2011 to July 2011. This may probably be due to an index of increase organic pollution at downstream site (D) as compared to upstream site (A) which is mainly due to addition of different kinds of effluents in the river. But raised water level due to rain fall in July 2011 it is very flow water in the river. Another reason may be due to disposal of waste water and sewage remains critically the same. The major portion of plants and animals formed of body organic for protein, chlorophyll and wood waste etc.

The present analytical study reveals that sulphate as well as phosphate values are significantly increased at down stream site (D) throughout the study period as compared to upstream site (A). Increasing value of sulphate and phosphate at down stream site (D) is probably due to presence of sulphate and phosphate in the soil of Asanriver as well as in ground water also present which is an established fact and Asan River continuously receives a lot of untreated domestic sewage. The underground water of Murena is very hard and contains high amount of sulphate and phosphate in it. When this ground water due to continuous use, reach in Asan water increase the amount of sulphate and phosphate.

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