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NUTRIENT STATUS OF PADMALAYA LAKE AT ERANDOL, DISTRICT JALGAON

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ABSTRACT:

Water is an essential component of the environment and it sustains life on the earth. All organisms depend on water for their survival (Smitha et.al 2007). Freshwater bodies are important wetlands located in and around human habitations as they are generally semi natural ecosystems constructed by man in landscape suitable for water stagnation (Yadav et.al, 2013). The quality of drinking water is essential for life. Contaminants such as bacteria, viruses, heavy metals, nitrates and salt have polluted water supplies as a result of inadequate treatment and disposal of waste from humans, livestock, industrial discharges, domestic discharge and extensive use of limited water resources (Onwughara NI 2013). Water defects and contamination of existing water supplies threaten to be critical environmental issues today for agricultural, domestic and industrial uses.

KEYWORDS: *Nutrient status, water quality analysis, Padmalaya Lake.*

INTRODUCTION:-

Human-induced eutrophication, or nutrient over enrichment, is a rapidly growing environmental crisis in freshwater and marine systems worldwide. Nutrients that cause eutrophication include nitrogen and phosphorus. While nitrogen and phosphorus are critical to biological processes in aquatic ecosystems, increased runoff of these nutrients to aquatic ecosystems from land-based sources results in increased biomass production, upsetting the natural balance of these ecosystems.(WRI-2009) . Most of the lakes, especially near urban or residential areas, are found to be polluted at different levels because of anthropogenic activities. Some examples of such lakes from India are: Bada Talab near Bhopal city, Hussain Sagar Lake in the heart of Hyderabad city , Dal Lake in Srinagar , all affected by organic pollution. The traditional uses of the lake have been disturbed due to deterioration of lake water. Deterioration of lake water is also responsible for public health problems in surrounding area. Therefore, regular monitoring of lake water quality & lake ecosystem is necessary for taking appropriate environmental measures to protect & conserve lake water quality suitable for urban ecosystem. (Sanyogita R. Verma et al.2011).

STUDY AREA

Erandol is one of the important taluka of Jalgaon It is situated near the Anjani river and Tapi valley of the Deccan Plateau between the Satpura hills and Ajanta hills.Jalgaon has the situation on coordinates is 20.997984°N 75.566711°E It has an average elevation of 227 meters (744 feet). Shree Kshetra Padmalaya, is located at around 30km from Jalgaon Present Investigation was undertaken in the year 2017 (January to December) for the

study of nutrient levels in the lake Padmalaya.

MATERIALS AND METHODS

For sampling the 1 liter plastic bottles were used and appropriate preservatives were added at the time of sampling and brought into the laboratory for analysis. Methods used are as per the guidelines of APHA 1998/2005 and CPCB, MPCB (Waste Water standard) and NEERI manuals. For Nitrite-Nitrate Aplpha Napthylamine Hydrochloride, for Phosphate Stannous chloride, for sulphate barium sulphate and for pH Hand pH meter method was used.

ANALYSIS OF STATUS OF PADMALAYA LAKE WATER:

Table -1: Levels of Nitrate from January to December 2017

Sr. No	Month	Sampling site No.01	Sampling site No.02	Sampling site No.03	Sampling site No.04
01	Jan	22	21	24	23
02	February	27	24	19	26
03	March	30	29	21	27
04	April	35	32	23	30
05	May	40	43	24	46
06	June	48	47	26	43
07	July	51	52	29	40
08	August	36	37	27	25
09	September	32	28	24	26
10	October	28	30	26	25
11	November	26	31	24	23
12	December	24	30	24	22

Source: Prepared by Author

The standard limit of Nitrate is 50 mg/L. The Nitrate Level of the lake water is higher in July at site 1. In the month of January the concentration of Nitrate was within 21-24 mg/l range. In February, the lowest concentration of Nitrate was measured at Site No. 3 i.e. 19 mg/L, followed by 27 (Site 1), 24 (site 2), and 27 (site4) mg/L respectively. In the month of March again concentration of Nitrates varies from 21 to 30 mg/L. In April highest concentration of Nitrates was found at site 1 (35mg/L) and the lowest observed at Site 3 (23 mg/L). In the May, concentration of Nitrates reaches up to 46 mg/L at site No. 4, While in June higher concentration of Nitrates found at Site 1 (48 mg/L). In July Site 1& 2 shows high percentage of Nitrates i. e. 51 & 52 Mg/L. while site no. 3 shows extremely low concentration of Nitrates as compare to previous sites. In August and September, the moderate ranges of Nitrates were 24 to 36 mg/L. In October, November and December constantly, the concentration of Nitrates were vary slightly between 22 to 28 mg/L. Throughout the year, the maximum concentration of Nitrates reaches up to 51 mg/L (in July), while low concentration found at January (21 mg/L). The variation in concentration of nitrate throughout the year is representing by graphically as below fig.1.

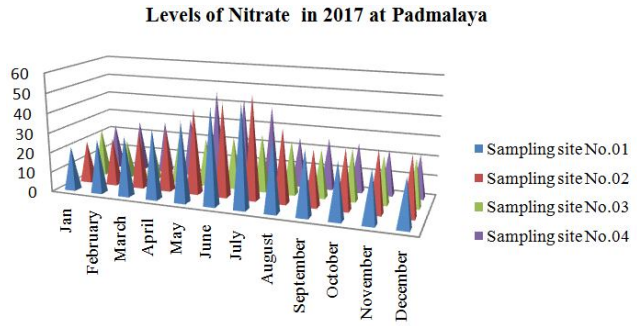

Fig.1: Levels of Nitrate in 2017 at Padmalaya

Table-2: Levels of Phosphate from January to December 2017

Sr. No	Month	Sampling site No.01	Sampling site No.02	Sampling site No.03	Sampling site No.04
01	Jan	1.3	1.2	.9	1.6
02	February	1.5	1.7	1.0	1.5
03	March	1.8	1.9	1.1	1.7
04	April	2	1.7	1.3	1.5
05	May	2.6	2.1	1.4	1.6
06	June	2.8	2.9	1.5	1.8
07	July	2.9	3.0	1.4	2.4
08	August	4.1	3.0	1.6	2.6
09	September	4.0	3.5	2.7	2.4
10	October	3.1	2.7	1.3	2.6
11	November	3.2	2.3	1.4	1.9
12	December	2.8	2.1	1.5	1.8

Source: Prepared by Author

The normal level of Phosphate is 5.0 mg/L. The Phosphate Level of the given lake water is upper in August at sampling site no 1 with 4.1 mg/L. In the month of February the concentration of Phosphate was lowest within 1.0 mg/L range. The average range of Phosphate has recorded in lake is within 1.0 to 4.1 mg/L. In the month of February, the lowermost concentration of Phosphate was observed at Site No. 3 i.e. 1.0 mg/L, shadowed by 1.5 (Site 1 & 4), and 1.7 (site 2) mg/L respectively. In the month of March again concentration of Phosphate differs from 1.8 to 1.7mg/L. In April uppermost attentiveness of Phosphate was found at site 1 (2 mg/L) and the lowermost observed at Site 3 (1.3 mg/L). In the month of May, concentration of Phosphate ranges up to 2.6 mg/L at site No. 1, While in June maximum concentration of Phosphate recorded at Site 2 (2.9 mg/L). Month of July sample site no 1 and 2 has been reveals that higher proportion of Phosphate is observed with 2.9 & 3.0 respectively, while site no 3 found very low proportion of Phosphate i.e. 1.4. In the month of August and September the average medium ranges of Phosphate were recorded between 4.0 to 1.6 mg/L. October month shows the highest concentration of Phosphate is found in site 1 with 3.1 mg/L and lowest is observed at site no 3 i.e. 1.3 mg/L. In November and December frequently, the concentration of Phosphate has been high level fluctuate slightly between 3.2 to 2.1 mg/L in site no 1 & 2 respectively and site no 3 & 4 the lowest Phosphate has been recorded with 1.4, 19, 1.5 and 1.8 mg/L respectively. Overall the year of 2017, the extreme concentration of Phosphate ranges up to 4.1 mg/L in the month of August, while low concentration observed at February with 1.0 mg/L. The difference in concentration of Phosphate all over the year is showing by graph as below fig. no 2.

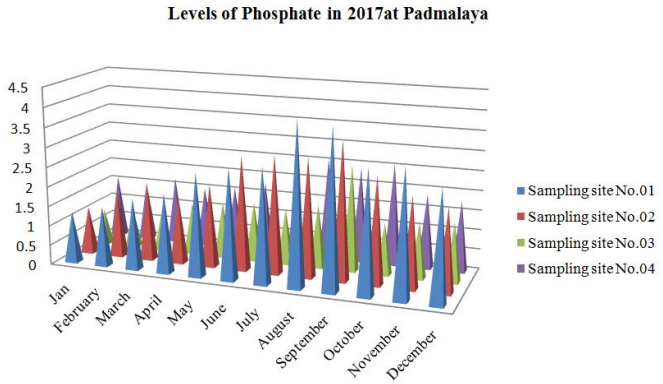

Fig.2: Levels of Phosphate in 2017at Padmalaya

Table -3: Levels of Sulphate from January to December 2017

Sr. No	Month	Sampling site No.01	Sampling site No.02	Sampling site No.03	Sampling site No.04
01	Jan	77	79	60	81
02	February	85	82	65	86
03	March	90	91	70	90
04	April	120	110	80	105
05	May	110	115	82	112
06	June	130	125	84	111
07	July	113	110	86	107
08	August	122	116	90	91
09	September	90	95	67	92
10	October	95	90	66	90
11	November	89	92	62	86
12	December	86	93	61	83

Source: Prepared by Author

The standard limit of Sulphate is 400 mg/L. The highest limit of Sulphate in given lake water observed in month of June with 130 mg/L at sampling site no 1 and subsequently the lowest concentration of Sulphate has been recorded in the month of January at sampling site no 3 within 60 mg/L. The normal range of Sulphate is obtained in lake water within 130 to 60 mg/L in June and January at site 1 and site 3 subsequently. In the months of April to August Sulphate range has been recorded within 105 to 130 mg/L at the sample sites of 1, 2 & 4 and consequently Sulphate range found in the same month at sample 3 is 80 to 90 mg/L. in the month of January to March the Sulphate were concentrated within range of 65 to 91 mg/L at all four sites. September to December Sulphate average rang has been found between 61 to 95 mg/L at all four selected sample sties, highest 95 mg/L value is showed in month of September at site 2 and very lowest range observed at 61 mg/L at site 3 on the month of December. The graphically representation of above analysis of Sulphate in the year of 2017 has shown in fig. 3.

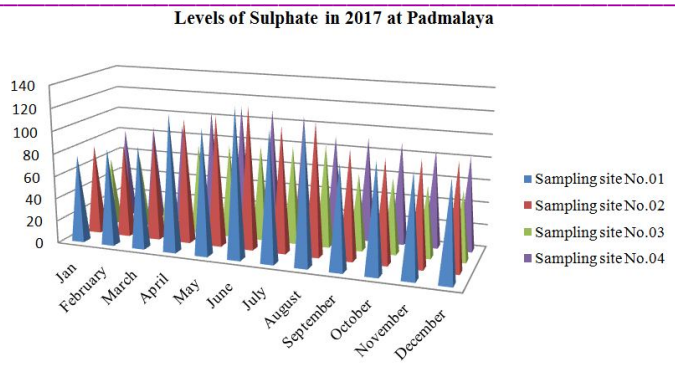

Fig.3: Levels of Sulphate in 2017 at Padmalaya

Table -4: Levels of pH from January to December 2017

Sr. No	Month	Sampling site No.01	Sampling site No.02	Sampling site No.03	Sampling site No.04
01	Jan	7.4	7.3	7.2	7.3
02	February	7.3	7.4	7.3	7.3
03	March	7.4	7.3	7.2	7.4
04	April	7.3	7.4	7.3	7.3
05	May	7.3	7.3	7.2	7.3
06	June	7.3	7.3	7.3	7.4
07	July	7.5	7.4	7.3	7.3
08	August	7.3	7.4	7.3	7.2
09	September	7.6	7.3	7.3	7.3
10	October	7.4	7.3	7.3	7.3
11	November	7.4	7.4	7.2	7.3
12	December	7.3	7.3	7.2	7.3

Source: Prepared by Author

The standard limit according to BIS is 7.5 to 8.5 according to pH theory, the range 1 to 6.9 showed acidic natures, 7 is neutral and 7.1 to 14 represent the basic nature of water. In present study overall analysis of pH parameter in given Water Lake has been recorded between 7.2 to 7.6 pH results. In this table depicted that maximum pH is obtained in the month of September with pH value is 7.6 and lowest pH have recorded in the month of January, March, May, November, December and august with the pH is 7.2 at sample site no 1, 3, & 4 subsequently. This table near about 29 times frequently pH has concentrated within the range of 7.3 in throughout the year of 2017 at all four sampling sites from 1 to 4. As per the analysis of water standard limit give water lake pH quality is basic nature of water has been recorded. Graphically represented the distribution and concentration of pH quality of Padmalaya lake water is given figure no 4.

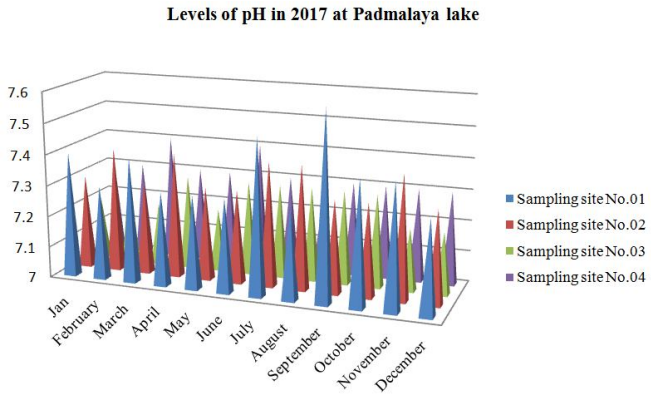

Fig.4: Levels of pH in 2017 at Padmalaya lake

RESULTS AND CONCLUSION:

In the present Investigation the levels of nitrate was found highest in the month of July it is 52 mg/L in sampling station two and lowest levels was found in the month of February it is 19mg/l in sampling station no three. The amount of phosphate was observed maximum in the month of august it is 4.1mg/L and observed minimum in the month of January 0.9mg/L. The highest level of sulphate was found in the month of august it is 122mg/L in sampling station one and lowest levels were found in the month of January it is 60mg/L at sampling station three. pH was found maximum in the month of September at sampling station one it is 7.6 and minimum pH was found in the month of august at sampling station four it is 7.2 all the analysis shows that if the lake is not conserved it will turn into eutrophic in near future so there is urgent need to conserve the Padmalaya lake.

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