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STUDY OF PHYSICO-CHEMICAL PARAMETERS OF KALAPUR LAKE OF KARIMNAGAR (DIST), TELANGANA, INDIA

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Keywords:

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ABSTRACT

Present study carried out of Kamalapur Lake in Karimnagar district of Tellangana state. The Lake water spread area over 70 million cubic meters. Lake situated at Latitude (14º36'N) Longitude (78º42'E) Kamalapur village in Karimnagar. The lake receives most of water from canals and the agricultural paddy fields. The catchment area of the lake is agricultural fields of dry and wet and receiving the agricultural fields. The study of various physicochemical parameters were carried out over a period of one year from 2013 to 2014 of Pre monsoon, monsoon, post monsoon seasons. Sampling of water for deferent physiochemical characteristics was carried monthly in every fortnight from 8.00 am to 11.00 pm The analysis of physical and chemical characteristics was carried out in the site and in the laboratory using standard method of APHA-1999 and by using Systronics P-4 water analysis kit (E-Merck). In the present study the seasonal changes are revealed that the parameters are within the permissible limits as prescribed by BIS(1991) During the period of study Temperature, pH , E.conductivity , Alkalinity, dissolved oxygen, Hardness, chlorides, Fluorides , Total solids, total hardness, Calcium , Magnesium , Carbonates were determined.

INTRODUCTION

Lakes have well defined borders, they can be repeatedly sampled at low cost, the life spans of biological components from lakes are short and hence lakes are easy models for study of ecology. The lakes in terms of their productivity classified into 3 catagories - Oligotrophic , Eutrophic, Dsytrophic. Lakes vary enormously in latitude, altitude, size and depth, but each lake is a closed ecosystem. Study of lakes in India depicts diverse conditions, as the lakes are Arctic, Temperate, Sub-tropical as well as from tropical regions. According to Abbasi, (1997) all natural lakes are ecosystem with regular food production-consumption and scavenging cycles. So that the biological components of fresh water depend solely on physico-chemical conditions. Analysisof physical and chemical parameters of water are therefore essential. The physico-chemical parameters of the lakes in India and abroad has been carried out by Swarnalatha (1994); Sedamkar and Angadi (2003); Akin *et a/* (2008); Mathur et al (2010); Verma *et. a/.* (2011); Joshi and patel (2012); Siddhartha *et.* a/.(2013).

MATERIAL AND METHODS

Kamalapur Lake water spread area over 70 million cubic meters. Lake situated at Latitude (14º36'N) Longitude (78º42'E) Kamalapur village in Karimnagar. The lake receives most of water from canals and the agricultural paddy fields. The catchment area of the lake is agricultural fields of dry and wet and receiving the agricultural fields.The study of various physicochemical parameters were carried out over a period of one year from January – December 2014.Sampling of water for deferent physiochemical characteristics was carried monthly in every fortnight from 8.00 am to 11.00 pm The analysis of physical and chemical characteristics was carried out in the site and in the laboratory using standard method of APHA-1999 and by using Systronics P-4 water analysis kit (E-Merck). In the present study the seasonal changes are revealed that the parameters are within the permissible limits as prescribed by BIS(1991) During the period of study Temperature, pH , E.conductivity , Alkalinity, dissolved oxygen, Hardness, chlorides, Fluorides , Total solids, total hardness, Calcium , Magnesium , Carbonates were determined.

RESULTS AND DISCUSSION

Water temperature:

Water temperature of Kamalapur lake ranges highest temperature was noticed during the pre mansoon and lowest was during the post monsoon .According to Welch (2003) generally

water temperature was corresponding with air temperature indicating that the samples collected from shallow zone have direct relevance with air temperature, shallow water reacts quickly with changes in atmospheric temperature.

pH:

The pH value recorded ranges from 7.14 to 7.66 .The low value pH during monsoon May be due to dilution of rain water. A fall in pH values in monsoon seasons was also recorded by Siddhartha et al (2013).

Electrical conductivity:

Electric conductivity recorded in Kamalapur Lake ranges from 447 mmho to 599.2 mmho. According to Vetriselvi et al (2011) the high value of conductivity was recorded during monsoon and low value was recorded during summer.

Alkalinity:

Kamalapur Lake ranges from 138.5 mg /me to 158.7 mg /me. The high value of alkalinity was recorded during winter and the low value of alkalinity was recorded during summer season. These values also agrees with the findings of Siddhartha et al,(2013).

Dissolve oxygen (D.0.):

Amount of dissolve oxygen is higher in those places where there is sufficient aquatic life. In Kamalapur Lake dissolved oxygen recorded ranges from 6.02 mg/l to 6.44 mg/l. The high D.O. in summer is due to increase in atmosphere temperature and duration of bright sunlight has influence on the % of soluble gases (02 & Co2).

Total hardness:

The total hardness of water causing ions in water are mainly calcium and magnesium and are the measure of the capacity of water to react with soap. The total amount hardness in the water of Kamalapur Lake ranged from 102.13 mg/l to 117.2 mg/l. Maximum and minimum hardness during summer and winter respectively reported by Telkhade et al (2012).

Chloride:

The high amount of chloride was recorded during pre monsoon season and low value was recorded during monsoon seasons. Siddhartha et al (2013) also noticed higher value of chloride during summer and lower during winter and monsoon.

Fluorides

Florides are recorded in the ranges of 1.29, 1.28, 1.26 mg/l.All the values of fluorides are in permissible limits. Fluorosis may occur when fluoride level exceed the recommended limits.

Total dissolve solids:

Kamalapur Lake the amount of total dissolve solids ranged from 6.02 mg/l to 6.44 mg/l. The high amount of TDS was recorded during monsoon season with little variation in winter where as low amount of TDS was recorded during summer season.

Calcium

Calcium hardness was also calculated along with total hardness and all the values were with in the standard limits of WHO (1984) i.e. 200 mg/l. The Ca^{++} hardness was in the range of 25.8 mg/l to 26.28 mg/l

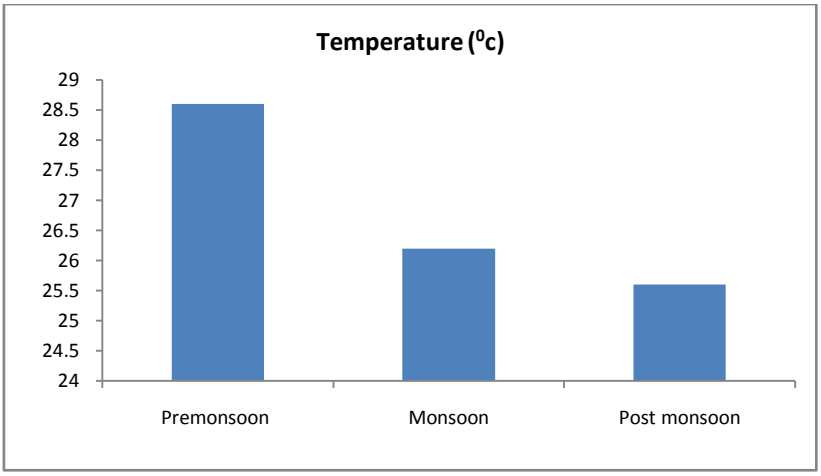
Magnesium

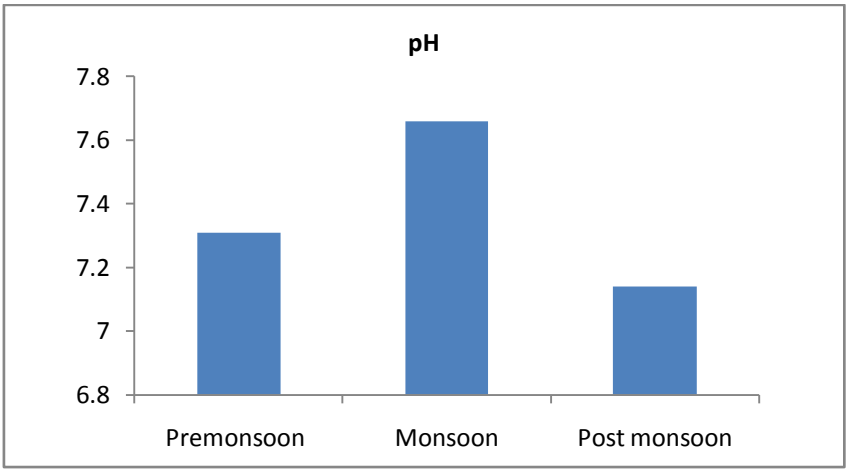
Kamalapur Lake shows magnesium in the ranges from 19.2 to 22.5 mg/l hene it is in desirable limit **Carbonates**

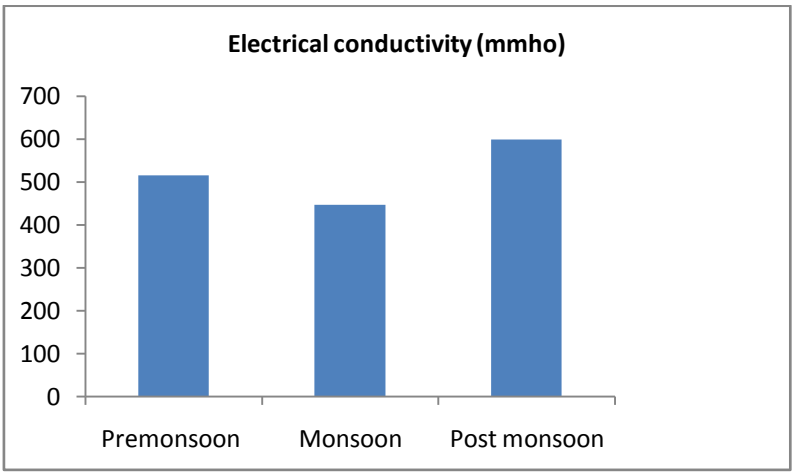
In present study Carbonates are ranged in pre mansoon, mansoon, post monsoon seasons are 0.6, 0.8, 0.42 mg/l

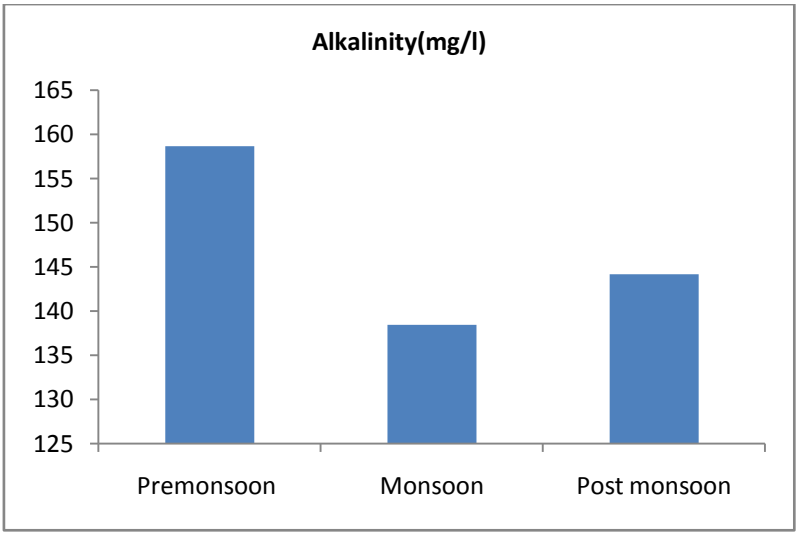
Physicochemical parameters of kamalapur lake, Karimnagar

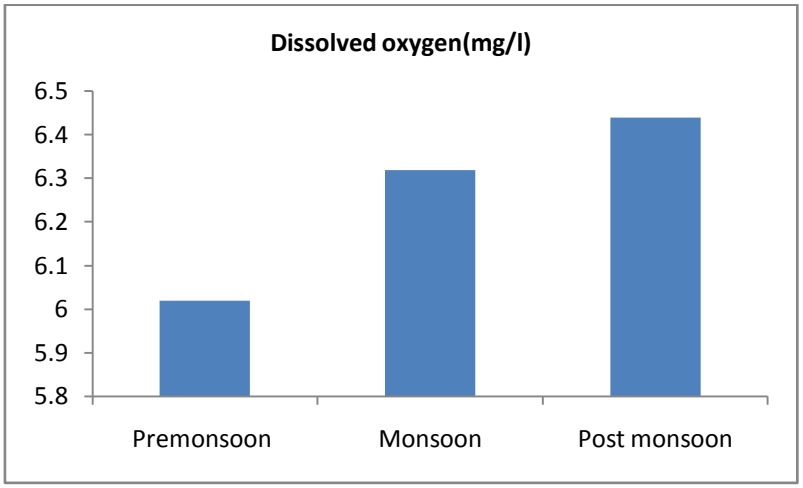
Parameter	Pre monsoon	Monsoon	Post monsoon
Temperature (^{0}c)	28.6	26.2	25.6
pH	7.31	7.66	7.14
Electrical conductivity(mmho)	514.3	447	599.2
Alkalinity(mg/l)	158.7	138.5	144.2
Dissolved oxygen(mg/l)	6.02	6.32	6.44
Hardness(mg/l)	102.13	114.9	117.2
Chlorides(mg/l)	103.8	80.52	88.29
Fluorides(mg/l)	1.29	1.28	1.26
Total solids(mg/l)	42.28	37.29	92.83
Calcium(mg/l)	26.28	26.0	25.8
Magnesium(mg/l)	19.2	22.5	20.2
Carbonates(mg/l)	0.6	0.8	0.42

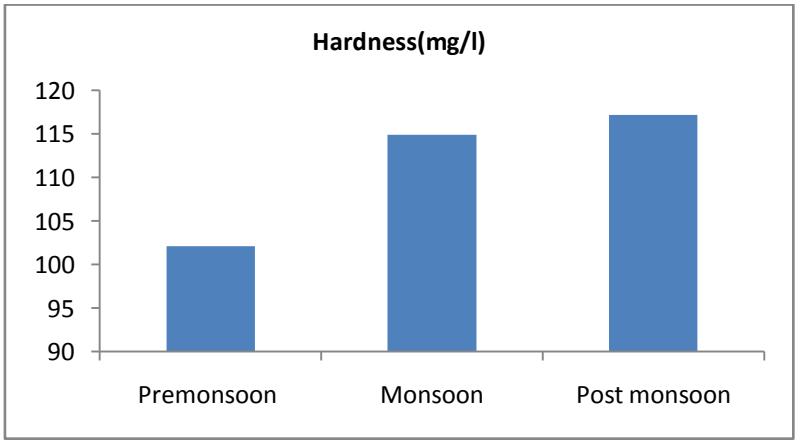

Temperature (°c)
29
28.5
28
27.5
27
26.5
26
25.5
25
24.5
24
Premonsoon
Monsoon
Post monsoon

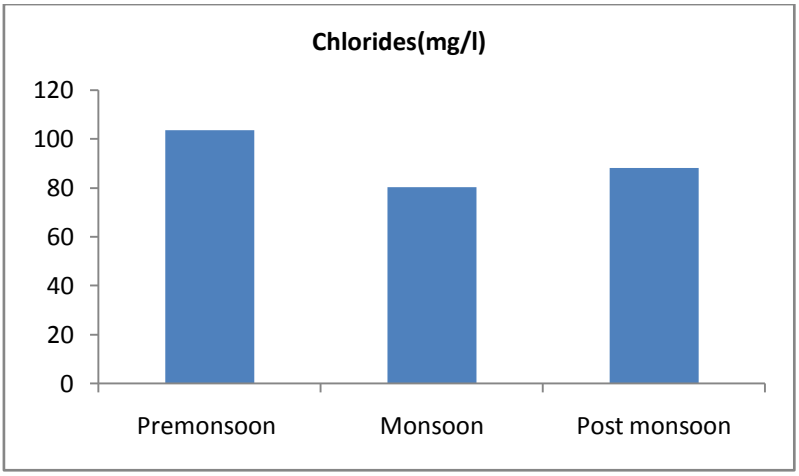

pH
7.8
7.6
7.4
7.2
7
6.8
Premonsoon
Monsoon
Post monsoon

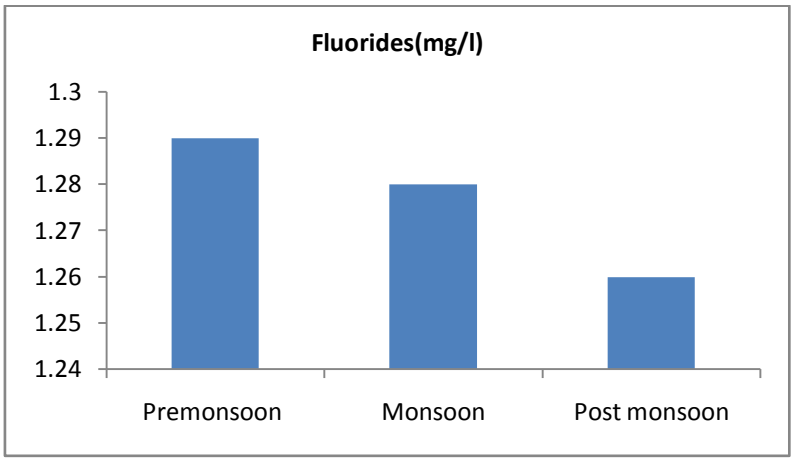

Electrical conductivity (mmho)
700
600
500
400
300
200
100
0
Premonsoon
Monsoon
Post monsoon

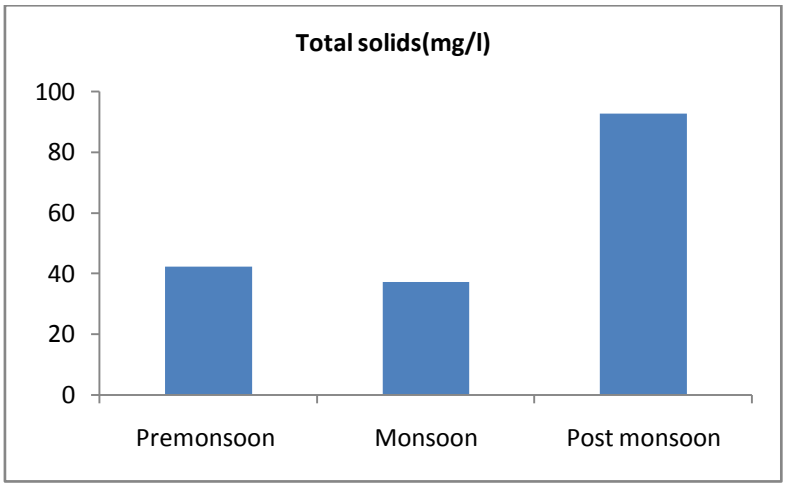

Alkalinity(mg/l)
165
160
155
150
145
140
135
130
125
Premonsoon
Monsoon
Post monsoon

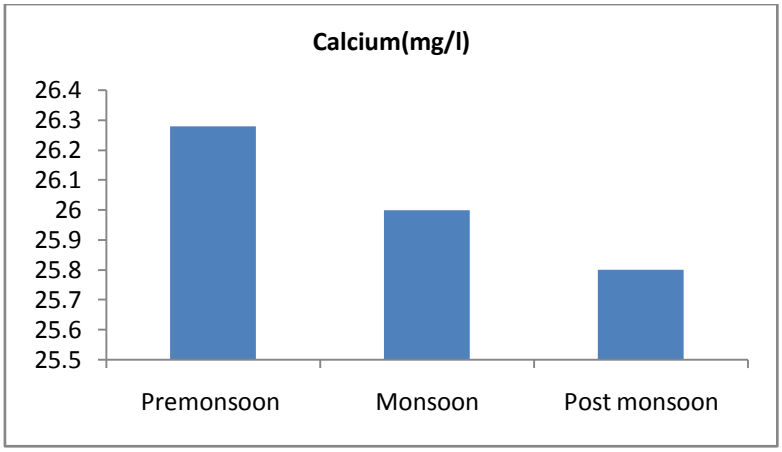

Dissolved oxygen(mg/l)
6.5
6.4
6.3
6.2
6.1
6
5.9
5.8
Premonsoon
Monsoon
Post monsoon

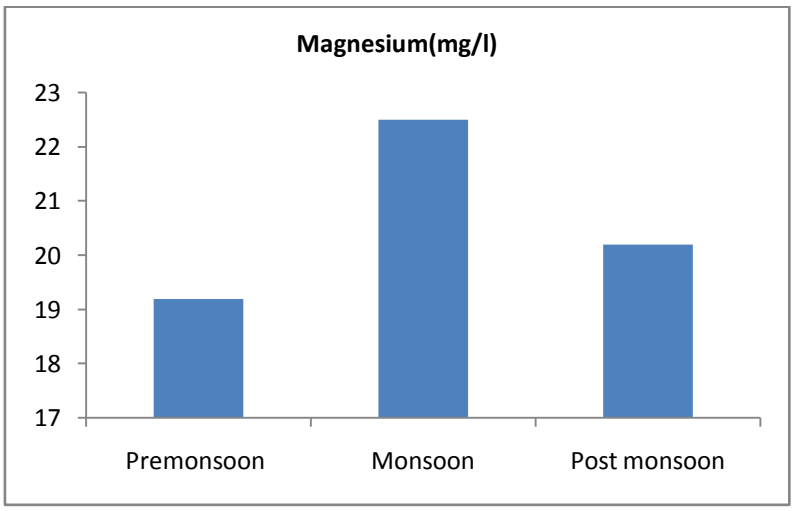

Hardness(mg/l)
120
115
110
105
100
95
90
Premonsoon
Monsoon
Post monsoon

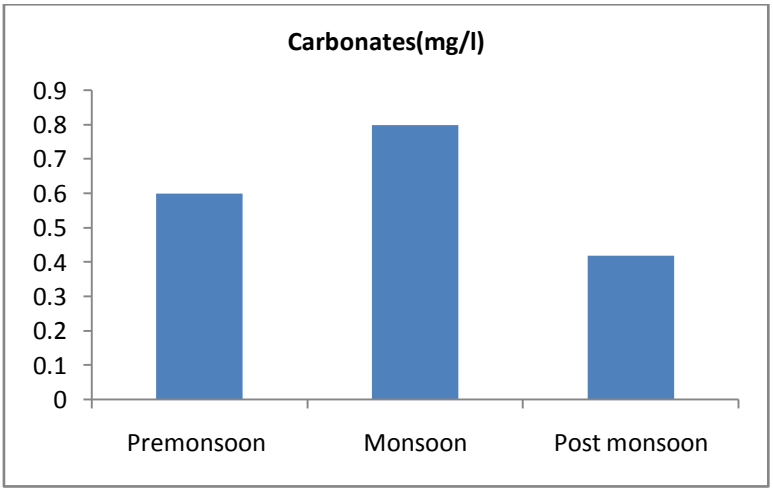

Chlorides(mg/l)
120
100
80
60
40
20
0
Premonsoon
Monsoon
Post monsoon


Fluorides(mg/l)
1.3
1.29
1.28
1.27
1.26
1.25
1.24
Premonsoon
Monsoon
Post monsoon


Total solids(mg/l)
100
80
60
40
20
0
Premonsoon
Monsoon
Post monsoon







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