SEASONAL VARIATION IN PHYSCIO-CHEMICAL PARAMETERS OF UJANI RESERVOIR OF MADHA TAHASHIL, DIST, SOLAPUR

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The present investigation the physico-chemical characteristics of Ujani reservoir water were studied during the year 2003-2004. The Ujani reservoir in Mahada Tashil is one of the major irrigation project of Krishna valley basin and the water is being used for different purposes viz, agriculture, industrial, drinking, fish culture etc. Therefore it is necessary to study the liminological characteristics of the reservoir. The Ujani reservoir is situated between 18^0 - 04 – 0" N latitude and 75^0 – 07 -0" E longitude. The main purpose of Ujani reservoir is constructed to provide water for irrigation in Solapur district but the present days the water of reservoir is also used for drinking purpose to Solapur, Pandharpur, Sangola, Mangalwedha and Akluj cities.

Materials & Methods-The water samples were collected from the Ujani reservoir from three selected sites I,II and III for a period of one year 2003-2005. The physical parameters such as temperature, transparency and pH were performed at the fixed three sites. The temperature of air and water at then three sites was recorded by using a mercury thermometer. The transparency of light was measured by using seechi disc. The pH of water was determined by using Hanna champ pH meter. The chemical parameters such as dissolved oxygen, free carbon dioxide, total alkalinity, total hardness, chloride, nitrates, phosphate, total dissolved solids were determined by APHA(1998) and Koderkar et.al.(1998). The tests particularly dissolved oxygen and free carbon dioxide were performed at the sampling sites.

Results & Discussion-Monthly mean value of physico-chemical cal parameters of Ujani reservation from July-2003 to June 2005 are given in table no. 1 & 2. The comparison of physico-chemical parameter by ICMR & WHO is represented for table No. 3. In the present investigation the two year average value of atmosphere temperature was ranged 31.91 C^0 and 31.48C^0. During the year 2003-2004 of study the atmospheric temperature was range from 21.92 C^0 in January to 41.02 C^0 in April. During the year 2004-05 the atmospheric temperature ranged from 23.22 C^0 in December to 42.55 C^0 in May. But the average water temperatures are recoded as 28.62 C^0 and 29.77 C^0 during the study period. In the year of 2003-2004 the water temperature ranged from 20.9 C^0 in January to 36.85 C^0 in April but in the year of 2004-2005 it was ranged from 21.72 C^0 in December to 39-02 C^0 in May. The season wise analysis shaved that the average air and water temperature in the reservoir was maximum during summer, comparatively less during monsoons & learn during winters. Similar reports are reported by Angadi (1985), Goel (1988), & Kadam (1997). The transprancy value of reservoir recorded as 38.18 cm & 36.49 cm in 2003-04 & 2004-05. The transparency mean value of reservoir during first & second years from 32.32 cm to 48.00 cm and 31.37 cm to 50.05 cm in the month of February October and May, October respectively. The lowest transparency was observed during summer season and highest value recorded during rainy season during both the years. According to Gaur et.al (1995) has observed higher transparency during rainy season and minimum during summer. Similar finding were reported by Times & Midgley (1970) Singh & Swaroop (1979) and Khan & Chaudhari (1994).Two year average values of recorded as 8.11 and 8.33. The PH ranged from 7.13 to 8.66 during first year and 7.79 to 8.68 during second year. The maximum ph values were recorded during summer while it was minimum during mansoon during first & second year respectively. Singh & Sinha (1993) reported lower value during mansoon, high values during winter and moderate values during summer. Similar observations were made by Bandela et-al (1999), Khan & Choudhari (1994).

The two years average values of dissolved oxygen recorded as 6.57 mg/lit. During 2003-04 and 7.12 mg/l during 2004-05. The amount of dissolved oxygen various from 5.15 to 7.78 mg/l and 5.46 to 7.74 mg/l during first & second year respectively. The minimum dissolved oxygen was recorded during summer and maximum during mansoon. The higher

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values of dissolved oxygen in winter season in reservoir can be attributed to low temperature which help the water to hold high oxygen in the dissolved tale. Similar finding have also reported by Nair & Rajendrana (2000), Kumar (1995) and Rao et-al (1995). The average values of free carbondioxide are recorded as 2.65 mg/l during 2003-04 and 2.23 mb/l during 2004-05. The values of free carbondioxide varied from 0.79 to 6.97 mg/l during first year and 0.85 to 5.13 mg/l during second year. During both the years of investigation the free carbondioxide was observed during rainy month it was very low during winter & summer months. Kumar (1995) has reported 0. to 5.5 mg/l free CO_2 in fresh water body in Bihar. In the present study presents & observe of CO_2 may be govern by temperature. Simillar observations are made by Khan & Choudhary (1994), Parvateesam & Mishra (1993). The average values of total alkalinity recorded as 169.47 mg/l during 2003-04 and 175.43 mg/l during 2004-05. The values of total alkalinity varied from 14.5 to 192.50 mg/l during first year and 148.25 to 199.00 mg/l during second year. Lower alkalinity values were recorded during monsoon & higher during summer as all sites. The monsoon minimum & winter maximum of alkalinity was reported by Kumar et-al (1997). The low total alkalinity in monsoon in the present study may be attributed to dilu effect similar observation were made by Shastri & Pendese (2001), Bhardwaj and Sharma (1999). The average values of total hardness recorded as 98.80 mg/l during 2003-04 and 118/00 mg/l during 2004-05. The total hardness of water ranged between 72.04 mg/l to 125.47 mg/l during 2003-04 and 100.60 mg/l to 131.30 mg/l during 2004-05. The total hardness was found higher during summer than winter & monsoon. Higher values of total hardness of water can be attributed to decrease in water volume and increase in the rate of evaporation at high temperature minimum hardness in the month of December may be due to ultamatly havey rainfall. Similar findings of seasonal variation reported by Naik & Purohit (1996), Kumar (1995), Kaur et-al (1997), & Nair (2000). The value of chloride varied from 22.76 to 49.91 mg/l during 2003-04 and 24.81 to 43.99 mg/l during 2004-05 the average values of chloride recorded 34.53 mg/l during 2003-04 and 36.55 mg/l during 2004-05. The minimum chloride was recorded during winter season & maximum during smmer season. The seasonal trend in the chloride was found to be same during both the years of investigation. The observations of present investigation are in good agreement with the finding of Kodarkar & Chandrashekhar (1995), Swarnalatha (1994), Mahojar (1996) & Koderkar (1995). In the present investigation the average values of mtatie recorded as 0,080 mg/l & 0,0857 mg/l during 2003-04 & 2004-05. The tmitrate values varied from 0,030 to 0,120 mg/l and 0.086 mg/l during 0.120 mg/l and 0,028 to 0,086 mg/l during first & second year. The minimum mitraten were recorded during winter season & maximum during summer season. The seasonal trend of winter was found to be same during first & second year. The mibate is osbally nor toxic in the less quantities found an lakes and rigers (Upto 1 mg/liter) The drinking water standard for human beings are set at sbout 10 mg/liter (Raghvendran, 1992). The result obtained during the investigation are in good agreement with the finding of Trivedy (1998) & Adoni, et-al (1985). The phosphate is one of the most important major nutrients that are required to living organisms. Lack of phosphors is after the jaig cause of poor productivity of water body Jhingran, (1982). The average value of phosphate required 0.185 mg/l during 2003-04 & 0.126 during 2004-05. The values of phosphates varied from 0.062 to 0.217 mg/l during first year and 0.047 to 0.205 mg/l or the second year. The minimum phosphate was recorded during winter season & maximum during summer and monsoon season. The seasonal trend in the phosphates was found to be same during first & second year. Similar observation were made by Goldman & Horne (1083), Jhinhran (1982) and Jain & Seetapathi (1996). The total dissolved solids values of reservoir varied from 143.37 to 340.25 mg/l during first year 2003-04 and 199,44 to 330,96 mg/l during second year 2004-05. The average values of total dissolved solids were recorded as 256.17 mg/l during 2003-04 and 270.68 mg/l during 2004-05. The similar trend of TDS was observed by Transeao (1916), Paka & Rao (1997) and Holgatts (1921). The average values of TSS were recorded as 155.50 mg/l during first year and 189.37 mg/l during second year. The values of TSS ranged from 114.78 to 199.95 mg/l during 2003-04 & 154.53 to 216.47 mg/l during 2004-05. The TSS varied seasonally being maximum during monsoon & minimum during summer. The higher values of TSS during rainy season recorded at the season can be attributed to surface ranoff from catchments area which being in silt particles and other organic material, these observations are similar to finding of Rao et-al (1995) & Paka & Rao (1997).

The total solids value varies from 306.97 to 432.00 mg/l during 2003-04 and 399.19 to 466.88 mg/l during 2004-05. The values of total solids showed seasonal variation being maximum during summer & minimum during winter. Pandey & Tripathi (1985) have reported average total solids values 2876.67 mg/l ranging between 2150 to 4166.67 mg/l in Chandari Pand water. Sathe et-al (2000) recorded maximum in summer seasons in the siddhewadi reserson . These finding support the present investigation.

Conclusion:-The physico-chemical parameters of Ujani Reservion consider that the seasonal changes have been observed during the two year study period. The temperature is acceptable, pH, dissolved oxygen, total alkalinity total hardness, chloride, nitrates, phosphates are slightly higher than the prescribed limit of WHO & I CMR and it is accro phosphates are slightly higher than the prescribed limit of who & I CMR and it is acceptable for the drinking purpose but the reservo water to use for drinking purpose before proper treatment.

Table No. 1. Monthly mean value of physico-chemical parameters of Ujani reservoir from July 2003-June 2004.

Months/ Parameters	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June
AT	28.6	29.0	31.7	30.0	30.1	26.9	21.9	24.1	37.6	41.0	39.4	39.2
WT	27.1	27.1	27.1	28.4	26.4	22.3	20.9	22.5	29.7	36.8	36.2	36.6
TR	39.6	42.1	46.3	48.0	43.3	38.7	36.2	32.3	32.8	32.6	32.3	34.8
PH	7.1	7.6	7.8	8.2	8.5	8.3	8.1	8.0	8.6	8.5	8.1	7.3
DO	7.7	7.3	7.4	7.2	7.6	7.4	7.3	5.3	5.4	5.1	5.2	5.5
CO2	6.2	6.9	5.8	5.0	1.6	1.4	0.9	0.8	1.6	0.9	0.7	1.8
TA	146	152	173	174	175	172	175	160	159	175	192	177
TH	105	98.4	93.4	82.2	76.3	72.0	91.2	101	111	125	124	116
CH	38.3	33.1	31.6	31.9	29.7	22.7	24.0	32.1	38.1	42.7	46.9	39.0
NI	.05	.120	.040	.030	.057	.087	.037	.075	.096	.077	.056	.048
PH	.217	.170	.131	.084	.069	.062	.081	.091	.143	.175	.169	.157
TDS	297	284	275	169	149	143	151	277	318	332	340	333
TSS	137	114	121	128	126	157	158	167	177	182	193	199
TS	396	384	351	331	306	344	351	374	358	410	432	422

Table No. 2. Monthly mean value of physico-chemical parameters of Ujani reservoir from July 200 June 2005

Months/ Parameters	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June
AT	34.4	28.1	29.7	29.4	28.9	23.2	23.3	23.3	32.1	38.5	42.8	41.4
WT	30.8	29.3	26.2	28.1	28.2	21.7	23.4	23.9	31.7	37.3	39.0	37.4
TR	40.7	43.0	47.2	50.0	43.5	39.8	36.6	35.7	33.0	32.3	31.3	33.4
PH	8.0	8.3	8.4	8.5	8.2	8.1	8.2	8.4	8.4	8.5	8.6	7.9
DO	7.4	7.3	7.5	7.6	7.7	7.6	7.1	5.4	5.5	5.6	5.4	5.5
CO2	3.3	5.1	4.2	3.0	1.9	1.6	1.5	0.9	1.0	0.8	0.8	2.3
TA	148	149	158	163	162	170	185	187	196	193	199	189
TH	131	120	110	106	100	107	117	123	126	125	123	122
CH	42.0	40.0	33.6	32.3	26.6	24.8	28.3	39.7	38.8	43.9	47.7	40.8
NI	.038	.079	.037	.086	.080	.052	.060	.083	.072	.06	.037	.028
PH	.152	.131	.100	.047	.084	.071	.092	.145	.169	.157	.171	.205
TDS	307	284	218	199	201	240	256	262	295	315	328	330
TSS	215	201	168	159	167	200	214	216	198	198	176	154
TS	466	425	409	399	416	441	441	485	486	469	468	442

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