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A Study of Chemical Characteristic of Pravara River, In Different Sites – Ahmednagar District, Maharastra , India.

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ABSTRACT :

The quality of water is of main role for man since it is directly linked to human health. The quality of water varies widely with respect to its various uses and the water quality suitable for one purpose may not satisfactory for another. The present investigations of the comparative study of physico chemical parameters of Pravara riverwater in Ahmednagar district of Maharashtra. The samples were collected in sterilized polythene bottles of one litter capacity monitoring were done during January 2018. There are 12 Physico-chemical parameters having test observed in five sampling sites along the course of Pravara river were selected for the study viz. Streams from catchments area (Site-I), Wilson dam (Site- II), Nilwande (Site-III), Kalas (Site-IV) and Ashwi . Water samples were collected during morning hours. chemical parameters of the samples were analyzed. Physical parameters include , pH and chemical parameters are tested Conductivity, Calcium, Magnesium, Sodium, Palash, Carbonate, Bio -carbonate, Chloride, Sulfate, Sodium Stable Ratio, Residual Sodium Carbone.

KEY WORDS: Physical and Chemical Characteristic, Pravara River,Water analysis.

INTRODUCTION:

Drinking-water supply has a primary objective of protecting humanhealth, including ensuring access to adequate quantities of safe water. It hasbeen estimated that approximately 17% of the world's population uses waterfrom unprotected and remote sources, 32% from some form of protected sourceand 51% from some sort of centralized system to the dwelling or plot.Of the latter, a small but increasing proportion applies some form of treatmentwithin the

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home. Individual water consumption occurs both at home andelsewhere, such as at schools and workplaces. Drinking-water is consumed notonly as water per se but also in beverages and incorporated into foodstuffs. Inresponse to increasing global and local water scarcity, there is increasing use of sources such as recovered or recycled waters, harvested rainwater and desalinatedwaters.

The quality of water is of main role for man since it is directly linked to human health. The quality of water varies widely with respect to its various uses and the water quality suitable for one purpose may not satisfactory for another. The present investigations of the comparative study of physico chemical parameters of Pravara riverwater in Ahmednagar district of Maharashtra. Four samples were collected in the month of January 2018. Physical and chemical parameters. The result indicates that there is marked variation in physico chemical parameters of that dam water andsites of Pravara river.

STUDY AREA AND SAMPLING SITES:

Four sampling sites along the course of Pravara river were selected for the study viz. Streams from, Wilson dam (Site- I), Nilwande (Site-II), Kalas (Site-III) and Ashwi (Site- IV). Water samples were collected during morning hours. Chemical parameters of the samples were analyzed physical parameters pH, and chemical parameters was calcium, magnesium.

Table no 01: Location of sampling sites

Sr.no	Name of sites	Location
01	Bhandardara	$19^0$53’ 72” N Latitude to 73^0 76’ 52” E longitude
02	Nilwande	$19^0$54’ 62” N Latitude to 73^0 90’ 27” E longitude
03	Kalas	$19^0$52’ 92” N Latitude to 74^0 07’ 11” E longitude
04	Ashwi	$19^0$52’ 05” N Latitude to 74^0 36’ 65” E longitude

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AIMS AND OBJECT:

1. To study physical conduction of middle pravara basin area.
2. To study Physico - Chemical Characteristic of Pravara River in four site. e.g pH, conductivity, calcium, magnesium, sodium, palash, carbonate, bio carbonate, chloride, sulfate, sodium stable ratio, residual sodium Carbone.

It is expected that study will be helpful in designing the management strategies for sustainable development and management of river water with the drinking water resources in the rural part of kalas, Bhandardara, Nilwande and Ashwi in Maharashtra

METHODOLOGY:

Four different sites were selected for collection of samples in Pravara River. Collection and analysis of water samples were done at day interval, during the period of two days.The samples were collected in sterilized polythene bottles of one litter capacity monitoring were done during January 2018. Samples were analysis of physico chemical parameters in laboratory (Krusi Vidnyan Kendra, Babhaleshwar). There are 12 Physico- chemical parameters having test.Five sampling sites along the course of Pravara river were selected for the study viz. Streams from catchments area (Site-I), Wilson dam (Site- II), Nilwande (Site-III), Kalas (Site-IV) and Ashwi . Water samples were collected during morning hours. chemical parameters of the samples were analyzed. Physical parameters include , pH and chemical parameters are tested Conductivity, Calcium, Magnesium, Sodium, Palash, Carbonate, Bio -carbonate, Chloride, Sulfate, Sodium Stable Ratio, Residual Sodium Carbone.

RESULT AND ANALYSES :

We are selecting four site of Pravara River in Ahmednagar district for the case study of water content analysis. Specially we selected these four village near the bank of Pravara river. For this purpose we selected purposive random sampling survey method and collected the water sample of the Pravara river from namely in Bhandardara, Nilwande, Kalas and Ashwi sites respectively.

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Table No 01 : Water Analyses with Sample Sites

Sr. No	Elements	Sampling Sites				Scale
		Bhandardara	Nilwande	Kalas	Ashwi	
1	pH	7.28	7.62	7.8	8.18	6.50-7.50
2	Conductivity	0.43	0.51	0.6	0.87	0.00-0.25
3	Calcium	0.8	1.9	1.4	3.6	0.00-1.50
4	Magnesium	3	3.6	3.8	4.4	0.00-5.00
5	Sodium	1.4	2.4	2.5	4.4	0.00-4.00
6	Palash	0	0	0.05	0.05	0.00-0.00
7	Carbonate	0	0	0	0	0.00-1.50
8	Bio carbonate	4.8	5.6	6.4	7.2	0.00-1.50
9	Chloride	5.2	6	6.8	7.6	0.00-2.00
10	Sulfate	1	1.2	1.5	1.7	0.00-2.00
11	Sodium Stable Ratio	1.0157	1.5492	1.5504	2.2	0.00-10.00
12	Water Classification	Medium	Medium	Medium	Low	-
13	Residual Sodium Carbone	1	0.8	1.2	0	0.00-1.25

Water Sample Analysis from Krusi Vidnyan Kendra, Babhaleshwar

WATER PHAND SALINITY:

pH is a measurement of electrically charged particles in a substance. It indicates how acidic or alkaline (basic) that substance is. The pH scale ranges from 0 to 14:

- Acidic water has a pH lower than 7. The most acidic substances have a pH of 0. Battery acid falls into this category.
- Alkaline water has a pH of 8 or above. The most alkaline substances, such as lye, have a pH of 14.
- Pure water has a pH of 7 and is considered “neutral” because it has neither acidic nor basic qualities.

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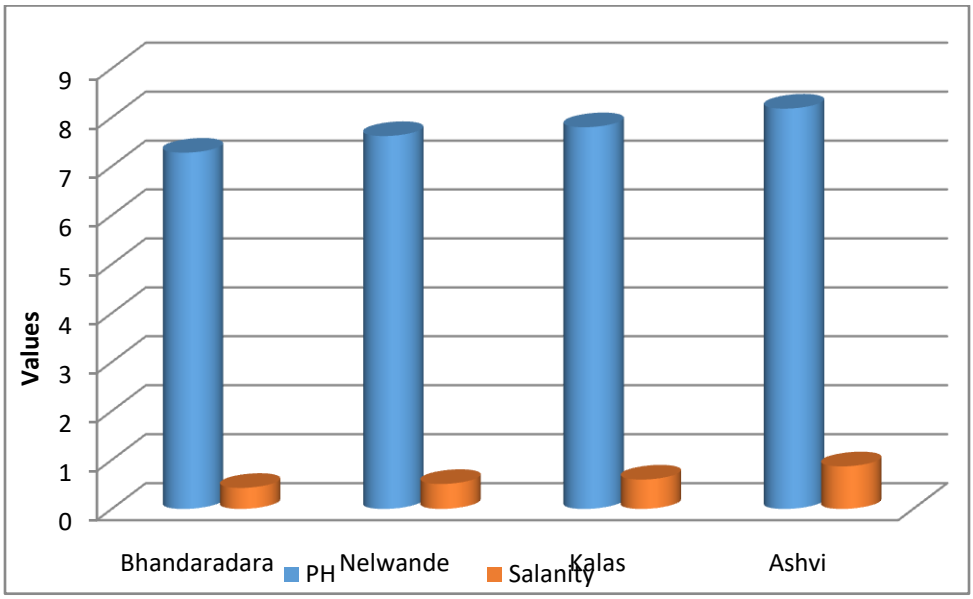
Table No 02 : Water pH and Salinity

Sr.No	Elements	Name of Sampling Sites				Scale
		Bhandardara	Nilwande	Kalas	Ashwi	
1	pH	7.28	7.62	7.8	8.18	0.50 to7.50
2	Salinity	0.43	0.51	0.6	0.87	0.00 to 0.25

Graph no 01: water pH and Salinity



The graph no 1 and table no 2 shows the physical water elements of Bhandardara, Nilwande, Kalas and Ashwi sites.

The scale of PH elements of the water is 0.50 to7.50, We find highest PH water element in Ashwi site (8.18PH) and lowest ph water elements in Kalas (7.8PH) village and in Bhandardara and Nilwande site having 7.28 and 7.62 PH water elements respectively.

The Ashwi site pravara river Ph was more than 8 thus this water is Alkaline water. Because of Alkalinityin a solution means the solution is capable of buffering acidic solutions with higher concentrations of hydrogen ions. Alkalinity in water comes from a high concentration of carbon-based mineral molecules suspended in the solution. Water with high alkalinity is said to be "hard." The most prevalent mineral compound causing alkalinity is calcium carbonate, which can come from rocks such as limestone or can be leached from

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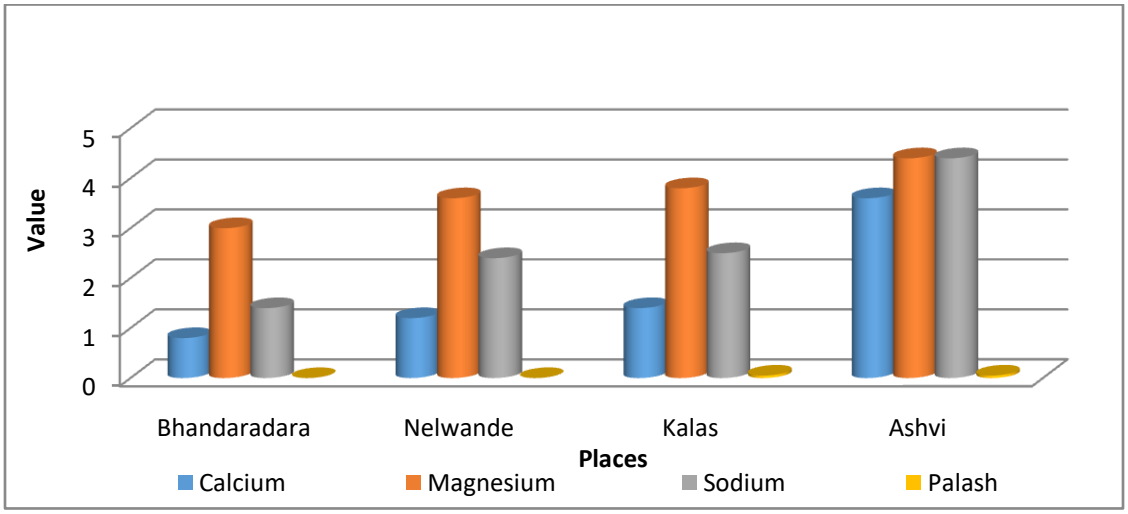
dolomite and calcite in the soil. Water treatment plants can be treated to a higher alkalinity. The source of high PH in Ashwi site agricultural fertilizers, waste water of Sagmaner city ect. In short these site not good conditions of water for drinking propose.

The scale or range of water salinity between 0.00 to 0.25, We find highest salinity water element in Ashwi Village (0.87mg/l) and lowest salinity water elements in kalas (0.6 mg/l) village. The Bhandardara and Nilwande this two site having 0.43 and 0.51 mg/l salinity water elements respectively. The ashwi site Pravara River water has not suitable for drinking and irrigation proposes but carful used of water in drinking proposes.

Table no 03 : Cl,Mg, Na,Palash

Sr.No	Elements	Name of Sampling sites				Scale
		Bhandardara	Nilwande	Kalas	Ashwi	
1	Calcium	0.8	1.2	1.4	3.6	0.00-1.50
2	Magnesium	3	3.6	3.8	4.4	0.00-5.00
3	Sodium	1.4	2.4	2.5	4.4	0.00-4.00
4	Palash	0	0	0.05	0.05	0.00-0.00

Graph no 02: Cl,Mg, Na,Palash



The above graph shows the water elements of Bhandardara, Nilwande, Kalas and Ashwi sites. According to WHO, the scale of Calcium elements of the water is 0.00 to 1.50. We find highest calcium water element in Ashwi site (3.6) and lowest calcium water elements in

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Bhandardara (0.8) site. And in Kalas and Nilwande village having 1.4 and 1.2 calcium water elements respectively. The scale of Magnesium elements of the water is 0.00 to 5. We find highest magnesium water element in Ashwi site (4.4) and lowest magnesium water elements in Bhandardara (3) village. And in Kalas and Nilwande sites having 3.8 and 3.6magnesium water elements respectively.

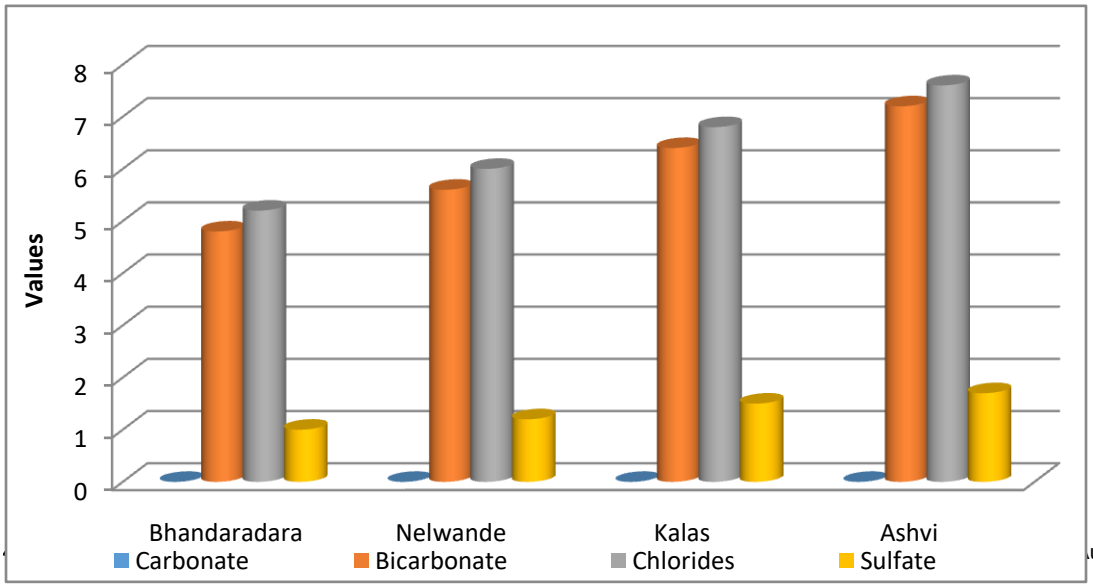
The scale of sodium elements of the water is 0.00 to 4.00. We find highest calcium water element in Ashwi site (4.4) and lowest calcium water elements in Bhandardara (1.4) site. And in Kalas and Nilwande sites having 2.5 and 2.4 sodium water elements respectively.

The scale of potash elements of the water is 0.00 to 0.00. We find highest potash water element in Ashwi and kalas sites is same (0.05). and lowest calcium water elements in Bhandardara and Nilwande site (0) is the two lowest water elements Bhandardara and Nilwande site respectively .

Table no04:Carbonate, Bio carbonate, Chlorides and Sulfate

Sr.no	Element	Name of village				Scale
		Bhandardara	Nilwande	Kalas	Ashwi	
1	Carbonate	0	0	0	0	0.00-1.50
2	Bio carbonate	4.8	5.6	6.4	7.2	0.00-1.50
3	Chlorides	5.2	6	6.8	7.6	0.00-2.00
4	Sulfate	1	1.2	1.5	1.7	0.00-2.00

Graph no03: Carbonate, Bio carbonate, Chlorides and Sulfate



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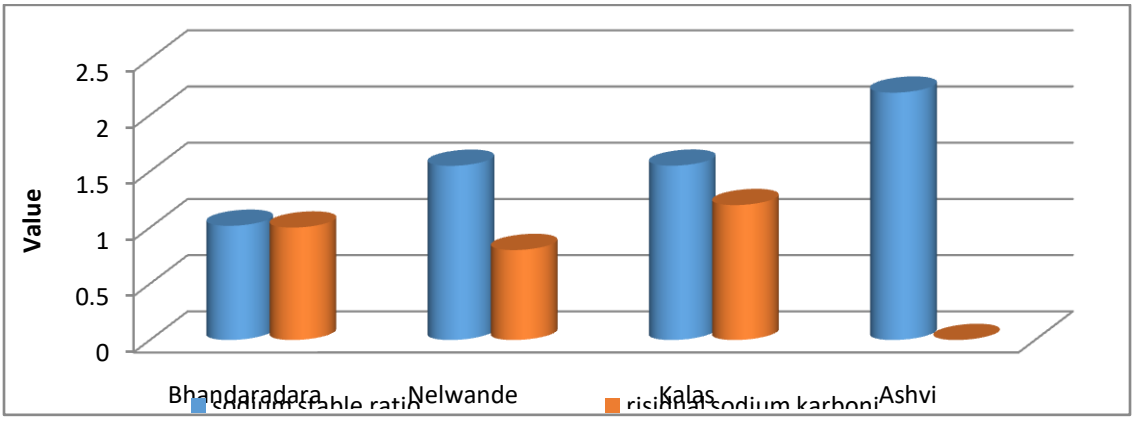
The scale ofcarbonate elements of the water is 0.00-1.50. We find highest magnesium water element in Ashwi site (4.4) and lowest magnesium water elements in Bhandardara (3) site and in Kalas and Nilwande site having 3.8 and 3.6magnesium water elements respectively. The scale of bicarbonate elements of water is 0.00-1.50we find the highest bicarbonate water elements in Ashwi site (7.2) and lowest bicarbonate water elements in Bhandardara village (4.8) and kalas and Nilwande (6.4) and(5.6) bicarbonate water elements respectively.The scale of chlorides elements of water is 0.00-2.00 we find the highest chlorides water elements in Ashwi site (7.6) and lowest water elements in Nilwande site is (2.6) and in Bhandardara and kalas site having 5.2 and 6.8 chlorides water elements respectively . The scale of sulfate elements of the water is 0.00 to 2.00. We find highest sulfate water element in Ashwi site (1.7) and lowest sulfate water elements in Bhandardara (1) site and in Kalas and Nilwande site having 1.5 and 1.2 sulfate water elements respectively.

Table no05: Sodium Stable Ratio and Residual Sodium Carbonate (RSC)

Sr.no	Element	Name and of village				Scale
		Bhandardara	Nilwande	Kalas	Ashwi	
1	Sodium Stable Ratio	1.0157	1.5492	1.5504	2.2	0.00-10.00
2	Residual sodium carbonate (RSC)	1	0.8	1.2	0	0.00-1.25

Graph no 04: Sodium Stable Ratio and Residual Sodium Carbonate (RSC)



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The above graph shows the water elements of Bhandardara, Nilwande, Kalas and Ashwi sites. According to WHO, the scale of sodium stable ratio elements of the water is 0.00 to 10.00 We find highest sodium stable ratio water element in Ashwi site (2.2) and lowest sodium stable ratio water elements in Bhandardara (1.01) site and in Kalas and Nilwande sites having 1.54 and 1.55 Sodium Stable Ratiowater elements respectively. The residual sodium carbonate (RSC) index of irrigation water or soil water is used to indicate the alkalinity hazard for soil. When dissolved sodium in comparison with dissolved calcium and magnesium is high in water, clay soil swells or undergoes dispersion which drastically reduces its infiltration capacity.The scale Residual Sodium Carbonate elements of the water is 0.00 to 1.25 We find highest Residual Sodium Carbonate water element in Kalas site (1.2) and lowest Residual Sodium Carbonate water elements in Ashwi (0) site and in Bhandardara and Nilwande sites having 1 and 0.8Risidual Sodium Carbonate water elements respectively.

FINDING:

1. Excessive application of chemical fertilizers and pesticides for high yielding crop as well as over irrigation are said major causes of high level salinity.
2. It has long tradition of over irrigation and use of fertilizers for mainly sugarcane.
3. Increasing pH and salinity towards in eastern side.
4. The Ashwai side high pH, salinity and other chemical parameters having high.
5. PH values shows, slightly alkaline nature of river water. It is within the limit of drinking purpose.
6. Gradual increase in alkalinity and hardness was found from upstream to downstream.
7. Increase in chloride concentration towards downstream may be due to increase in sewage contamination.
8. Calcium, Magnesium, Phosphate and Nitrate shows fluctuation along different station due to addition of sewage contamination
9. The wider human activity and the domestic waste cause the eutrophication
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CONCLUSION : level of salinity was measured in the study for understandingthe level of water pollution. Water pH and salinity less at Bhandardara and Nilwande because of it is fresh water and very low supplyof domestic water, chemical water in this sites. The increasing chloride concentration towards downstream may be increase in sewage contamination. The high level amount of all chemical components founding in Ashwai sites because of all domestic water gets from river all river sites city.

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REFERENCES

1. Arangale K. B et.al (2018) Physico-chemical Parameters Assessments of dam water in different sites of Ahmednagar district of Maharashtra,International Journal of Researches in Biosciences, Agriculture and Technology, Vol. VI (Special Issue 2), PP 7-9.
2. Bhave S. K. and Borse P. V. (2001). Seasonal variation in temperature, dissolved oxygen, pH and salinity and their influence on planktons in Aner river water, Jalgaon, Maharashtra. *Poll Res.* 20(1): 79-82.
3. Das, S. M. (1989). Handbook of limnology and water pollution, *South Asian Publisher, New Delhi*. pp- 1-174.
4. Deshmukh B. S.(2015), Physico - Chemical Characteristic of Pravara River, International Journal of Research Studies in Biosciences (IJRSB) Volume 3, Issue 10, PP 14-18.
5. Deshmukh, B.S. and Sathe, S.D (2014)Physico - Chemical Characteristic of Pravara River, *Journal of Aquatic Biology and Fisheries Vol. 2 ,PP101 to 105.*
6. Hussain, Ikbal and Husain Jakir. (2004). Evaluation of Drinking water quality of the Villages situated near river Kothari, Rajasthan (India). *Poll Res*. 23 (3): 555-559.
7. Jayaraman P. R., T. Ganga Devi, and T. Vasudevan Nayar. (2003). Water quality studies on Karamana river Thiruvananthapuram District, South Kerala, India. *Poll Res.* 22(1) : 89-100.

ISSN: 0474-9030

Vol-68-Issue-1-January-2020

8. Manna, R. K. and Das, A. K. (2004). Impact of the river Moosi on river Krishna I. Limno-chemistry. *Poll. Res*. 23 (2): 117-124.
9. Mini I., C. G. Radhika and T. Ganga Devi. (2003). Hydrobilogical studies on a Lotic Ecosystem Vamanapuram river, Thiruvananthapuram Kerala, South India. *Poll Res*. 22(4) : 617-626.
10. Mitra A. K. (1995). Water quality of some tributaries of Mahanadi. *Indian J. Envi. Helth.* 37(1): 26- 36.
11. Munnawar, M.(1970). Limnological studies on fresh water of certain polluted and unpolluted environments. *Hydrobiol.* 39 (1): 105-128.
12. Nandan, S. N.and More, Y. S. (2000). Assesment of water quality of Panzara river by saprobity system. *Oiko assay,* 14(1&2): 7-9.
13. Shastri Yogesh and D. C. Pendse. (2001). Hydribiological study of Dahikuta reservoir. *Journal of Environmental Biology*. 22 (1) : 67- 70.
14. Shastri, Y. C; Sonawane, Y. D. and Pingale, S. D. (2004). Physico-chemical characteristics of a village pond near Nasik. *J. Ecotoxicol. Environ. Monit.* 14 (2): 137-141.
15. Shastri, Y.C.(1999). Hydrobiological study of river Mousam, Malegaon, Maharashtra. *Geobios* 26 (4): 217-218
16. Shilpa Saxena and Ritesh Saxena. (2004). Water quality Index for Ram Ganga river water at Moradabad. *Poll Res*. 23(3) : 527- 531.
17. Singh Manvir and Gupta K. C. (2004). Physico-chemical studies of water of river Yamuna at Mathura. *Ecol. Envi. And Cons.* 10(2): 193-196.
18. Singh, H. R. and Kumar, N. (1993). River ecology and water pollution. *Enc. Environ. Poll*. *Con*. pp 255-272.
19. Singh, S. K. and Rai, J. P. N. (2003). Pollution studies on river Ganga in Allahabad district. *Poll. Res.* 22 (4): 469-472. Sinha
20. Thitame S. N. and Pondhe G. M. (2010),Assessment of Seasonal Variation in Physico-chemical Characteristics and Quality of Pravara River water for Irrigation use in Sangamner, Dist Ahmednagar, Maharashtra, *J. Chem. Pharm. Res., 2(2)PP 316-320.*

ISSN: 0474-9030

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21. Trivedy, R. K. (1990). Ecology and pollution of river Krishna in Maharashtra: II Physico-chemical Characteristics. *River pollution in India,* Ashish Publishing House. pp. 99-133.
22. Trivedy, R. K. and Goel, P. K. (1986). *Chemical and biological Methods for water pollution studies*. Environmental Publications, Karad (India). pp. 1-211.
23. Venkateswarlu, V. (1969a). An Ecological study of the algae of the river Moosi, Hyderabad (India) with special reference to pollution I. Physico chemical complexes, *Hydrobiologia,* 33 (1): PP117- 143.
24. Zafar, A. R. (1966). Limnology of the Husain Sagar lake, Hyderabad, India. *Phykos* 5 (1&2): PP 115- 126.