Physico chemical analysis of fresh water resources of pusad tehsil.

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Abstract
Experiments were conducted to analyze the physico-chemical parameters in water samples from Pus River, Sawangi stream and adjoining pond of Pusad Tehsil, District Yavatmal, Maharashtra. The population of the Pusad city and adjoining villages increased in recent years, hence there capacity of waste water and pollutants additions in fresh water resources were also increases. Due to pollution of water many diseases occur in area hence, for this purpose experiments were conducted to know the pollution status and water quality parameters viz., Temperature, pH, DO, total solids, BOD, Conductivity and total hardness.

Keywords: Physicochemical properties, water bodies, Pus River, Pusad

1. Introduction
Pusad tehsil is situated in Yavatmal district of Maharashtra state. The peoples of tehsil are mostly depending upon agricultural field for their income. Pus river is an important fresh water resource flows throughout the tehsil and peoples are depend on it for supply of drinking water, industries and agriculture irrigation purposes.
Water is one of the most important natural resource available to mankind. Knowing the importance of water for sustenance of life, the need for conservation of water bodies especially the fresh water bodies is being realized everywhere in the world [1]. The river water is main source for drinking and agriculture field. As water is one of the most important component of the ecosystem, due to increased human population, industrialization, use of fertilizers in the agriculture and man-made activity, the natural aquatic resources are subjected to heavy and varied pollution leading depletion of aquatic biota. It is therefore necessary that the quality of drinking water should be checked at regular time of interval, because due to use of contaminated drinking water, human population suffers from varied water borne diseases. It is difficult to understand the biological phenomenon fully because the chemistry of water reveals much about the metabolism of the ecosystem and explain the general hydro - biological relationship [2].
The rapid growth of urban areas has further affected groundwater quality due to overexploitation of resources and improper waste disposal practices. Hence, there is always a need for and concern over the protection and management of surface water [3]. The surface water quality within a region is governed by natural processes such as precipitation rate, weathering process, and soil erosion and anthropogenic effects such as urban, industrial and agricultural activities, and exploitation of water resources [4]. Changes in water quality were due to use of land for agriculture after water recedes in the dried up area of the wetland, waste disposal and polluting practices around the lake [5]. Hence we have taken the main purpose of our study to analyse physico-chemical parameters of the water bodies and its impact on water quality.

2. Materials and Methods
The water samples were collected in the month of March from the three localities i.e., Pus river, Sawangi stream and nearby pond of Taluka Pusad district Yavatmal. The water samples were collected in DO bottle of 300ml capacity as per standard direction and care is taken that atmospheric oxygen will not get dissolved in it to exaggerate the results. DO is calculated by using Wrinklers method by using Wrinklers A and Wrinklers B solutions. Total hardness is determined by using titration method. pH, Temperature, conductivity and BOD is determined by using physical instrumentation. For the total solid estimation 100 ml of water sample is taken in a beaker and water is evaporated and calculation is done by subscribing later weight from the earlier weight of the beaker.

Table 1: Observation

Sr. No.	Parameter → / Water bodies ↓	Total Hardness [ppm]	Dissolve oxygen (DO) [mg]	Total solids [gm/100ml]	Temperature	BOD [mg/l]	pH	Conductivity [μ]
1	Sawangi stream	294.3	5.7	0.325	32ºC	4.2	8.42	0.843
2	Pond water	141.7	Dry	0.426	Dry	-	-	-
3	Pus river	174.5	4.7	0.300	34 ºC	2.2	8.72	0.621

3. Results and Discussion
The water analysis was conducted in the three areas viz., Sawangi stream, pond water and Pus River at a time and results were recorded as follows

Temperature: Generally the research area is come under hot climatic weather however water temperature plays an important role which influences biochemical properties of water body. The temperature was ranges from 32ºC to 34ºC. However the recorded time is summer hence at this time pond water was dried.
pH: It is the key indicator of pollution. The pH value ranges from 8.42 to 8.72 of Sawangi stream and Pus River respectively. Hence the water was alkaline in studied area. The alkaline nature of water due to high pH values can be attributed to high productivity of water as evidenced by high

growth rate of algal population which utilized CO2 through photosynthetic activity. The ideal pH range is 6.7 to 8.4 while pH below 5.0 and above 8.3 is detrimental [1].

Dissolved oxygen (DO): Oxygen is an important eco-chemical parameter which is essential for the metabolism of all aquatic aero-biologically respired biota. Dissolved oxygen in water indicates water quality and diversity of living things. The aquatic life is held responsible for lowering the value of dissolved oxygen the overall DO ranges from 5.7 to 4.7 mg/l. As the Pus river flows a long distance it added many domestic and agricultural waste from overall area. However Sawangi stream has flows a small distance hence the waste percentage is low and has 5.7 mg/l DO percentage. The addition of a variety of biodegradable pollutants from domestic and industrial sources stimulates the growth of micro-organisms; which consume the DO of the water. DO is a good indicator of water quality and its relation to the distribution and abundance of various algal species along with the degree of pollution by organic matter and level of self-purification of water [6, 1].

Total hardness: The hardness is mainly due to dissolved salts of calcium and magnesium ions present in water [7]. During the present work successive decrease in the values of total hardness were as 294.3 ppm, 174.5 ppm and 141.7 ppm from Sawangi stream, Pus River and Pond water respectively observed in summer season. Higher values of hardness can be attribution to low water level and high rate of evaporation. There is a need to properly manage wastes in the city and control as well as monitor human activities in order to ensure that such activities have minimal negative effects on lakes. Awareness, proper understanding, planning and management of environmental resources are essential to prevent environmental degradation of these surface water resources [8].

Total Solid: For the assessment of drinking water quality total dissolves solid is one of the important criteria. As per above observations the total dissolve solids are found to be more in pond water making it unsuitable for human consumption whereas Pus river water supplied to the city for drinking and domestic purposes has least dissolve solids. In the present investigation percentage of total solids were recoded as 0.325, 0.426 and 0.300 gms / 100 ml of water of three localities.

BOD: BOD is a value of presence of organic materials in water which can support increasing of micro-organisms. Surface water (river, lake) containing BOD values 10 mgL-1 are consider being moderately and more than 20 mgL-1 as to be highly polluted water. As per our observations in present are i.e., Sawangi stream and Pus River have 4.2 and 2.2 mg/L BOD is present. Hence both the waters were less polluted.

Conductivity: Electrical conductivity (EC) is a measure of water capacity to convey electric current. It signifies the amount of total dissolved salts [9]. The conductivity observed to be in ranges from 0.843µ to 0.621µ Sawangi stream and Pus River respectively indicating the presence of high amount of dissolved inorganic substances in ionized form.

4. Conclusions

An adequate filter system is used before the use, which will remove suspended solids & colloidal particles. The results indicate the safe level of pollutant in water and best for consumption by humans, wild animals, cattle's and birds.

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6. References

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