Drinking Water Quality - Puttaparthi, Andhra Pradesh, India

[1]K.Mahammad Rafi, [2]Dr.M.Umamahesh, [3]Dr.G.V.Ramana Murthy

[1]Research Scholar, Department of Chemistry, Rayalaseema University, Kurnool, A.P
[2]Professor, Department of Chemistry, RGM College of Engineering &Technology (Autonomous), Nandyal, A.P
[3]Sr. Lecturer, V.R.College, Nellore.

***Abstract*: Puttaparthi is a very well known devotional place in Andhra Pradesh. This area is well environment friendly with rich of plants, hills, water sources etc.so that in my research work, I thought to assessment of drinking water in this area of villages by taking drinking water samples from selected sample points by using prescribed sampling procedures .Collected samples will send within 24 hours to lab for analyze of samples about physic-chemical Analysis of drinking water. Analyzed parameters are pH,EC,Turb.,F-,NO3-,SO42-,Temp,Dissolved oxygen, Total suspended solids ,Total Hardness, Chloride, and Trace metal ions are Cu, Zn, Mn, Fe, Al using the procedures outlined prescribed by Indian standards. The obtained results are after analysis compared with Indian Standard Drinking water specification IS: 10500-2012 16.finally we suggest after this investigation, Analysis and preserve the water should be carried out as per standards to prevent diseases periodically.**

***Keywords*: Puttaparthi, drinking water Quality, Physico-Chemical Parameters.**

Introduction: Water is essential for living organisms to survive their life, by water only maximum metabolism reaction human body is possible. Water content is very important in chemical reactions, preparation of Amino acids, storage eof Vitamins in the body .But when pure water is used to drink then only all reactions will go smoothly without any disturbances. If we can drink impure water based on contaminants some water born disease will recognized in our body many more health issues. So that pure water is essential, increasing population and its necessities have lead to the deterioration of surface and Sub surface water. for this study we selected four areas named as Bukkapatnam, Kotthacheruvu, Guntipalli, Puttaparthi, in each village we have taken 8 samples viz.4 ground water samples ,4 surface water samples codes are distributed as G1,G2,G3,G4 & S1,S2,S3,S4 .

Study area:

Puttaparthi (IAST: Puṭṭaparti) is a town in Anantapur district of the Indian state of Andhra Pradesh. It is located in Puttaparthi mandal of Kadiri revenue division. The original name of Puttaparthi was Gollapalli. The town is located on the banks of Chitravathi River which is a tributary of Pennar River, and is surrounded by undulating hills. The climate is generally hot and dry throughout the year, summer temperatures ranging from 34–42 °C (93–108 °F) and winter 22–27 °C (72–81 °F). The hotter months are from March until July and the milder months are from November until January."The southwest monsoons play a major role in determining the climate. The northeast monsoons are responsible for about one-third of the total rainfall. Some rainfall may be expected during the months of July and August and again from October to December." Puttaparthi is 475 meters (1558 feet) above sea level.

Sampling procedure;

Collect samples in an area free of excessive dust, rain, snow or other sources of contamination. Select a faucet for sampling which is free of contaminating devices such as screens, aeration devices, hoses, purification devices or swiveled faucets. Check the faucet to be sure it is clean. If the faucet is in a state of disrepair, select another sampling location. Collect samples from faucets which are high enough to put a bottle underneath, generally the bath tub or kitchen sink, without contacting the mouth of the container with the faucet. If you are collecting a first-flush sample for lead/copper, allow the water to run just a bit before collecting the sample but do not flush the lines as you want to collect a sample which has been in contact with the distribution system pipes for at least six hours. If you are collecting other types of samples, open the faucet and thoroughly flush. Generally 2 to 3 minutes will suffice, however longer times may be needed, especially in the case of lead distribution lines. Generally, the water temperature will stabilize which indicates flushing is completed. Once the lines are flushed, adjust the flow so it does not splash against the walls of the bathtub, sink or other surfaces.

Results & Discussion:

Sample Code	pH	EC µs/cm	Turb NTU	F^- (mg/l)	NO_3^- (mg/l)	SO_4^{2-} (mg/l)	Te Zp °C	DO Mg/l	TDS (mg/l)	Total Hardness (mg/l)	Chloride (mg/l)	Cu (mg/l)	Zn (mg/l)	Mn (mg/l)	Fe (mg/l)	Al (mg/l)
G1	7.6	263	15.63	0.32	32.54	98.12	29	6.1	478	145	69	0.023	0.75	0.009	0.16	0.02
S1	8.1	521	24.15	0.42	46.23	105.23	27	6.3	568	63	136	0.019	0.12	0.003	0.08	0.009
G2	7.3	942	14.23	0.86	29.32	75.46	25	7.4	684	196	312	0.023	0.21	0.032	0.16	0.009
S2	6.2	325	15.66	0.01	25.61	89.23	28	6.2	452	89	147	0.01	0.09	0.007	0.09	0.01
G3	8.2	352	32.56	1.41	27.32	26.85	28	5.6	965	348	166	0.021	0.58	0.023	0.23	0.12
S3	7.9	256	58.25	0.22	19.23	114.68	28	5.6	126	247	183	0.01	0.56	0.012	0.04	0.014
G4	6.5	325	26.32	0.54	26.35	89.92	26	6.3	254	156	142	0.026	0.23	0.008	0.06	0.012
S4	7.5	248	16.32	1.2	18.32	98.12	26	6.9	415	168	183	0.031	0.09	0.002	0.12	0.023

After successfully completed quality assessment of drinking water in Puttaparthi, Anantapuram district by choosing 4 villages randomly and from each village collected 2 different drinking water samples as ground water, surface water sources and finally try to will get maximum accuracy analysis report of selected parameters based on previous research works in this location. Here will discuss parameter wise fluctuations in different localities.

pH in Most natural waters are generally alkaline due to sufficient quantities of carbonates and bicarbonates. pH also changes diurnally and seasonally due to variation in photosynthetic activity. The fluctuations of pH in this location was 6.2-8.2 By observation of this results all are samples were in with in limit as on 6.5-8.5.

Electrical Conductivity is the measure of capacity of a substance or solution to conduct electric current. It was ranged from 248-942µS/cm.. By observation of this results all are samples were in with in limit as on prescribed by ISO i.e less than 800 µS/cm except G2

Turbidity is the cloudiness or haziness of a fluid caused by large numbers of individual particles that are generally invisible to the naked eye, similar to smoke in air. The measurement of turbidity is a key test of water quality. In drinking water, the higher the turbidity level, the higher the risk that people may develop gastrointestinal diseases. Turbidity values obtained in the present study as are 14.23-58.25NTU.

.The high concentration of **fluoride** is leads to Dental and skeleton fluorosis. The concentration of fluoride is vary in various areas as from 0.01-1.41mg/l by observation samples all are with in limit.

Nitrate is the most important of nutrient in Ecosystem. Generally water bodies polluted by organic matter exhibit higher values of nitrate As per standards Nitrate desirable limit is 45 and permissible limit is 100 mg/l..the nitrate are shown vary in selected area from 18.32-46.23mg/l, by observation all are samples are under Acceptable limit .

Sulphate ion if present in excess amount produce cathartic effect upon human beings. As per standards desirable limit is 200 and permisbile limit is 400 mg/l.The sulphate ion concentration is ranged from 26.85-114.68 mg/l., by observation all are samples are under limit.

It is an important parameter which is essential to the metabolism of all aquatic organisms that posses aerobic respiration. The **DO** values obtained in the present study area are as from 5.6-7.4mg/l by observation all samples are under limit.

TDS level as follows: excellent, less than 300 mg/litre; good, between 300 and600 mg/litre; fair, between 600 and 900 mg/litre; poor, between 900 and 1200 mg/litre; and unacceptable, greater than 1200 mg/litre in present study area TDS is ranged from 126-965mg/l,

Hardness of water is a very important to used in domestically and industrial purpose.It may cause scale deposition and sludge formation in industries .actually as per standards hardness of water is desirable limit is 200 and permissible limit is 600 mg/l..In present study area the hardness of water samples ranged from 63-348mg/l.all are samples with in limit as per standards.

Chloride occurs in water samples is leads to sewage pollution as per low and higher values. Chloride desirable limit is 250 and permissible limit is 1000 mg/l.Chloride values are ranged from 69-312mg/l.

In case of c**opper** If the water samples exceed the EPA copper action level of 1.5 mg per liter, water systems must use treatment to reduce corrosion. Consumers should take steps to reduce exposure to copper if they learn their water exceeds the action level.In the present study area Copper concentration ranged from 0.01-0.031mg/l. as per observation some samples are with in limit i.e. 0.05-1.5mg/l. some are above limit

Zinc is an essential element for humans, and most health issues are focused on a deficiency of zinc rather than an excess. Adverse effects of an excess of zinc are centered around gastro-intestinal issues.at present Zinc ranged from 0.09-0.75mg/l as per observation samples are under acceptable limit,As per IS standards acceptable limit is 5 permissible limit is 15 mg/l.

Manganese because of the staining which may be caused. As per the above results Manganese of drinking water sources is ranged from 0.002-0.032mg/l where as BIS value is 0.1-0.3 i.e: all of Manganese of all samples in its limit of BIS

Rainfall seeping through soil causes iron to dissolve and leach into groundwater, including wells and aquifers used to supply drinking water. . The drinking water standard for iron is 0.3 milli- grams per liter (mg/l), Iron overload can lead to hemochromatosis, which can lead to liver, heart and pancreatic damage, as well as diabetes. In this study area iron concentration ranged from 0.04-0.23mg/l.

The drinking water standard for iron is 0.03 – 0.2milli- grams per liter (mg/l).if It has been hypothesized that aluminium exposure is a risk factor for the development or acceleration of onset of Alzheimer disease (AD) in humans.At present Aluminium ranged from 0.01-0.023mg/l. Al of all samples in its limit of BIS.

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