Eco-Friendly Treatment For Water Pollution

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Abstract: Water is very important for the existence of any living form, is also a basic factor for the functioning of human physiology. Water scarcity is wide spread and created serious health effects. Water pollution involves any change in physical or chemical in water that bring out adversely effects to the living organisms and the quality of water. In this work, water samples collected from various distillery industries in Kodaikanal district of Tamilnadu . Therefore, present study is mainly aimed to eliminate hardness of water as well as chloride from potable water using natural coagulant such as *Strychnos potatorum L* seeds.

1. INTRODUCTION

Water pollution is causing deterioration of water quality. It is a major issue which affects both the developed and developing countries. Drinking water[1-4] from four different areas near sugar industry situated in Kodaikanal district. Physicochemical characteristics ofdrinking water samples were analyzed. The results were compared to BIS drinking water standard. The drinking water samples (S1, S2, S3 and S4) were collected from Kodaikanal district area contain more concentration of dissolved solids, hardnessand chloride. In this study, plant based material such as *Strychnos potatorum* L seed powder were used to remove the impurities from the water samples. The watersamples were treated with different dosage in *Strychnos potatorum* L seed powder. Among most dosages, higher reduction of impurities was observed in 0.4g of seed powder.

2. MATERIALSAND METHODS

2.1 Water SampleCollection

The drinking water sampleswere taken from the distillery industry from Kodaikanal district. Analytical grade chemicals have used throughout the entire study. All the water were filled in precleaned plastic bottles and stored in laboratory. The pH and temperature of the water wererecorded on spot during the watersample collection.

2.2 Choosing Strychnos potatorum L seeds (Nirmali seeds)

Coagulation is the most effective and economical means to remove impurities [5-8]. Coagulant dose is another significant factor for coagulation efficiency. Itis considered thatcoagulation activity is highly depend on coagulant dose and bivalent cation present in water. *Strychnos potatorum L* is a common natural coagulant, used in many parts of India for the treatment of drinking water and it is commonly known as Nirmali. The seeds extracts of the plant is anionic polyelectrolyte and form coagulation by inter-particle bridging.

3. RESULTS AND DISCUSSION

Good quality water isvery much essential foragriculture, industry and human existence. Without adequate quantity andquality of fresh water, sustainable development will not be possible. Sustainability is definedas “theability to

meet current needs without compromising the ability of future generationsto meet their own needs". Certain physical,chemical and biological standards are required toensure with availability for safety and drinking.

3.1 Physicochemical characterization of drinking water samples

The test drinking water samples analyzed for various physical and chemical water quality parameters and the observations are depicted in **Table 1 and 2.**

Table 1: The Physical parametersof various drinking water samples

S.No.	Sample	Colour	Odor	Temp	pH	TS (mg/L)	TDS (mg/L)	TSS (mg/L)
1.	S1	Colorless	Odorless	27 ºc	7.0	1100	1300	450
2.	S2	Colorless	Odorless	26 ºc	6.8	900	800	370
3.	S3	Colorless	Odorless	24 ºc	6.4	840	700	590
4.	S4	Colorless	Odorless	26 ºc	6.2	680	900	450

Table 2: The Chemical parameters of drinkingwater

S.NO	Sample	Acidity (mg/L)	Alkalinity (mg/L)	Hardness (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Chloride (mg/L)	DissolvedOxygen (mg/L)
1	S1	670	280	760	300	580	1150	5
2	S2	180	160	670	260	290	250	6
3	S3	300	190	700	150	660	820	7
4	S4	190	90	210	180	90	270	8

The physicochemical parameter values were obtainedfor drinking water samplesare given in Table 2. Based on the results, itwas noted that the quality of water varied greatly from one place to another. The final results of obtained datas were compared with BIS (Bureauof IndianStandard) standard. All the parameters of thesamples found withinstandard permissible limit except few parameters suchas TDS, hardness and chlorides. The water samples subjectedto treatment with ***Strychnos potatorum L*** up to 2hrs.

3.2 Removal of impurities from contaminated water samples by using natural coagulant

Watersamples with moreconcentration of TDS, hardness and chloride can be treatedwith naturally availableorganic material. Thedrinking watersamples have higher pollutants of above than the permissible limits.Hence,thenatural plant material was used for this treatment. The impurities reduction percentage is presented in **Table 3.** Higher total hardnesscould be due to dischargeof effluents and untreated waste frompolluting industries to nearby surface water sources. The higher value of total hardness observed could be due to the lowwater level and high rate of evaporation during summer. Bureau of Indian Standards accessible limit for total hardness indrinking water is 300 mg/l. Hardness prevents lather formation with soap and increases the boiling point of water.Normally,water hardness doesnot cause any hazardous health problems, but may cause serious economic threat.

Table 3: Effect of ***Strychnos potatorum L***on reduction of TDS, hardness and chloride from water

S.No	Sample	% reduction		
		TDS	Hardness	Chloride
1.	S1	60	70	72
2.	S2	82	85	74
3.	S3	65	58	75
4.	S4	48	64	80

4. CONCLUSION

Water pollution can adversely affect organisms as well as water quality. It is a world problem, affecting most of the industrialized nations. The present investigation concludesthat the tested potable water samples were polluted from the nearby industries. The watertreatment is much importance before supplying to the public. The treatmentwith *Strychnos potatorum L seeds* is very much utilized for the treatment ofdrinking water effectively. After treatment, the drinking water should be boiled before going to be consumption. The method used in this work follow ecofriendly techniques with good benefits.

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