

Coagulation Efficiency of Okra Seeds Extract for the Narmada River Water

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Abstract –This paper is focussed on the study of Okra seeds extract considering as a coagulant for the water treatment of Narmada River water, Narmada River water turbidity generally varies from 0.4NTU to 200 NTU. This study includes the analysis of physiochemical properties of water samples before and after the treatment in the laboratory such as TDS, PH, conductivity, alkalinity, Hardness, chlorides, fluoride and the turbidity analysis by using jar test.

Key words: TDS, Ph, Turbidity, Alkalinity, Chlorides, Hardness, Fluorides.

Introduction

Water is essential substance for the life of the living organisms and plants on the earth, the water play a vital role in agricultural activities, cultural activities, commercial activities, household uses, and in recreational and in environmental activities. This important Substance exist in liquid, solid and gaseous states. It is a tasteless and odourless substance in pure form. Water is only the Substance which naturally clean itself by sedimentation and flocculation, infiltration through the soil, and by naturally through Aeration, Evaporation but now a days water quality of surface sources degrading due to anthropogenic activities, and by urbanisation. However the natural process is too slow and difficult when excessive quantities of harmful substances are adjoin to the water.

Water sample

Water sample for the testing was collected from Narmada River at Tilwara Ghats at atmospheric pressure and atmospheric temperature different samples are collected from different locations during chhat puja and their raw water characteristics were recorded in laboratory.

Preparation of coagulants

Take 1gm of dry seeds using weight machine. Now take 1000ml of distilled water by using measuring cylinder and mix them manually now stands for 24 hours. After the filter them by using laboratory filter paper extraction is ready for use.

rapidly increasing population leads the pressure on existing sources, discharge of untreated sewage directly in to the water sources then it becomes necessary to treat the water, however water is a unique substance and sometimes due to the objectionable water quality this water is not suitable for drinking purpose is called non portable water but by giving a suitable treatment to this polluted water we can be converted it into drinkable water which is called portable water.

Materials and method

Preparation of extract

Okra which having hard fibbers and not eatable are brought from local market that is Satpula market Jabalpur, near Jabalpur engineering collage, Jabalpur, Madhya Pradesh, India. Select the defected Okra pods and separate them by putting into dustbin, wash remaining Okra pods which are unaffected by any germs wash with the fresh water now take a stainless steel knife and separate the outer fibber carefully take out the seeds dry them 9am to 5pm in sun light. . Now take the 1gm of these dry seeds soaked in the 1000ml of distilled water and stands for 24 hours then by using pipette now we can take desired ml of this extract the jar test is carried out the jar test is carryout.

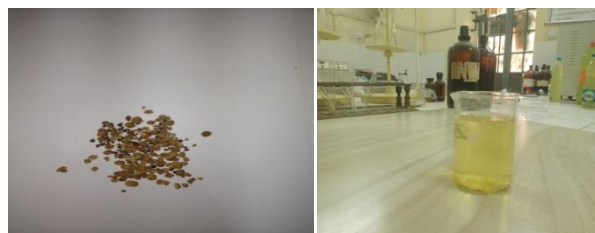


Figure-1: Dry Okra seeds and its Extract solution

Experiment work

Before treating the water samples, their initial parameter was check, especially PH, Turbidity, Total hardness, fluorides contain, Total dissolved solid(TDS), conductivity with the conductivity meter, Turbidity by Turbidity meter

Jar test is used to determine the coagulant property of Okra seeds extract. In this experiments six jar of capacity 1000ml fill with the water sample and 1ml, 2ml, 3ml, 4ml, 5ml, 6ml and 7ml, 8ml, 9ml, 10ml, 11ml, 12ml, of extract solution is added in first to six jar respectively and subjected to jar mixing 80rpm for 1 minute, slow mixing at 30 rpm for 15 minutes. After this switched off, the stirrer and allowed the flocks to settle without disturbing the jars for 30 minutes. The samples for residual turbidity measurement were drawn using a pipette from a height of 5 cm below the surface of each beaker, and the residual turbidity was measured for each sample of beaker. The effect of dose of Okra seeds extracts on removal of turbidity is also studies we find that the excellent floc formation so takes optimum dose as 6ml/1000ml.



Figure-2: Jar test apparatus in collage laboratory

Result and discussions

Result

1. Raw water sample parameters

Sr. No.	Parameters	Characteristics of water sample before coagulation
1	Turbidity(NTU)	14.3
2	pH	7.50
3	Alkalinity(mg/l)	100
4	Hardness(mg/l)	160
5	Fluoride(mg/l)	0.28
6	Total dissolved solids(mg/l)	112
7	Iron(mg/l)	0.09
8	Chloride(mg/l)	30
9	Conductivity(ppm)	625

2. Treated water sample parameters

Sr. No.	parameters	Characteristics of water sample after coagulation
1	Turbidity(NTU)	5.9
2	pH	8.25
3	Alkalinity (mg/l)	100
4	Hardness (mg/l)	120
5	Fluoride(mg/l)	0.28
6	Total dissolved solids(mg/l)	125
7	Iron(mg/l)	0.09
8	Chloride(mg/l)	30
9	Conductivity(ppm)	237

Discussions

The increase in water demand for different activities and increase in water pollution the quantity of portable water is decreasing rapidly the major population of Madhya Pradesh as well as India is facing with a water scarcity problem. The treatment plants are very expensive, ability to pay for services is minimal and kills as well as technology are scant. Therefore local available materials can be utilised towards achieving sustainable safe water supply. The study was conducted to Okra dry seeds for the water treatment. A study was mad for different extract solutions prepared from Okra seeds and use as a coagulant for raw water samples.

It was obtained that the maximum efficiency of 58.74% for 6mg/l as a optimum dose and the sludge obtained can use as a organic compost. Therefore the Okra seeds extract is used as a natural coagulant.

Conclusions

The increase in water pollution, urbanisation, industrialisation, living standard of people and population the demand of domestic water is also increasing many cities in India are facing the portable water scarcity in countries like India it is expensive to start a new treatment plant in required proportion. Therefore the locally available organic like Okra seeds can be utilised toward achieving sustainable safe water supply to all the people. In this research paper the study was conducted on Okra seeds Extract as a new alternative of the coagulant and its optimum dose in water treatment.

It was thus obtain that the maximum removal efficiency of turbidity is 58.74% by using optimum dose of Okra seeds Extract solution of 6ml/1000ml raw water.

The initial turbidity of raw water is 14.3 NTU becomes 5.9 NTU after treatment with the Okra seeds Extract. The

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sludge obtained after treatment can also be used as organic compost for agriculture uses.

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