

Industrial Waste Water Treatment using Banana Stem Extract

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Abstract:- Water is one of the large-scale attention for financial development general as its miles drastically applied in diverse efficient zones which incorporates agricultural products, industry, and concrete supply. The rapid-paced business development, monetary increase, and population increase in rising international locations have worried in surprising necessities of water in towns. This led to the concept of treating wastewater and utilize it for any other purpose. The waste water emerging out from the industries is full of chemicals and toxic substances which are harmful to environment and human health. The important intention of this paper is to investigate the effectiveness of banana stem extract in treating waste water amassed from maharaja cleaning soap industry. so that the amount of PH for waste water is 7.37%, electrical conductivity having 9.72%. The jar test waste water contain 10.5% and turbidity test 180 NTU hardness having waste water. Hardness and COD waste water is 0.01m 10mg/l.

Key Word: Natural Adsorbents, Extracts from banana stem, Adsorbents etc.,

1. INTRODUCTION

The overall populace in India is projected at 138 Crore human beings for the 12 months 2020. Now a days Food, Cloth and Shelter are the essential goals for a human. So that the development of industries. As in line with facts every district in India has minimum of 10 industries (Approximately). The manufacturing of calls for numerous clean water that has for use for irrigation purposes. A small scale industries makes use of 500 liters of water.

The waste water comes from the industries are genuinely doesn't have any trends that has to be used for the irrigation standards. The waste water coming out from the organization has first-rate amount of Total Suspended solids, Hardness and one-of-a-kind chemical parameters. This show to the water is mistaken for even irrigation standards. The waste created because of the dye from the cleansing cleaning soap now no longer best excessive in Biological Oxygen Demand however additionally excessive in chemical Oxygen demand. Due to the increase of enterprise, huge quantity of waste. Water carries the wastes coming from the dye enterprise creates unique styles of illnesses to the Humans. This is the principle

cause to deal with the waste water. However the remedy of waste water creates excessive price because of the aid availability. This may be lessen via way of means of the usage of herbal adsorbents that are additionally referred to as low price adsorbents.

The non-stop use of water makes it pollute so on the quite of the use purification of water is essential. This purification is intending with the aid of using exclusive remedy given to the water. It has been located that with inside the growing international locations extra than 1.6 billion human beings are the use of the unhygienic water and amongst them maximum of the human beings suffers from diarrhea and different water associated disorder. Untreated the chemicals and pathogens in wastewater can damage the fitness of animals, plant life and birds that line in or close to the water.

1.1 Maharaj Soaps Industry (P) LTD

Maharaja soaps enterprise personal limited (MSIPL) is thought for its prominent producer and dealer of detergent soaps, powder & liquids. Maharaja enterprise become installed with inside the year 2000 via way of means of Dr. Raviraja. M. E, chairman & dealing with direct, after a success year of trips in 2010 it has become to be Maharaja soaps industry private limited (MSIPL).



Fig1. Maharaja Soaps Industry

The organization has built its signal as a distinguished company of a more than one widespread variety of merchandise and has been regarded for fine own organization strongly makes a specialty of client requirement and pride client with its top class fine merchandise. With this goal, it has effectively catered its merchandise to clients that have been incredibly favored with inside the market. Maharaja soaps enterprise non-

public constrained is an unlisted non-public organization included on 29 September, 2009. It is assessed as a non-public constrained organization and is placed in Davangere, Karnataka its miles legal percentage capital is INR 9.90cr and overall paid up capital is INR 7.75cr.

Effective- have got invested years into medical improvement to find out the proper stability of planets and mineral primarily based totally substances to insure secure and powerful cleansing electricity our concentrated, non-poisonous merchandise are full of powder and formulated to move past current green merchandise and compete with traditional merchandise.

2. OBJECTIVES

1. To enhance the properties of collected wastewater from Industry.
2. Addition of Banana stem extract juice as a herbal coagulant for the remedy of waste water.
3. Study the various parameters such as Biological Oxygen Demand, pH, Chemical oxygen Demand, Hardness, and Turbidity of waste water collected from the soap Industries.
4. Recycle the waste water let out from the industries and make it suitable for other uses such as irrigation.

3. MATERIALS AND METHODOLOGY

The materials used for wastewater treatment are

1. Banana stem juice
2. Wastewater collected from industry

To collect wastewater samples from various industries and to collect matured banana stem extract from the local market. Mix the banana stem juice powder that is sun dried/banana stem extract solution that is strained with the waste water sample collected. They are tested using the coagulation jar test, hardness using titration method, turbidity using turbidity meter, pH using pH meter and removing from waste water.

3.1 Test Conducted for industrial Wastewater Samples:

1. Hardness
2. Chemical Oxygen Demand
3. pH Test
4. Coagulation jar test
5. Turbidity
6. Electrical conductivity

TABLE 1. INITIAL CHARACTERS OF WASTEWATER

Parameters	Initial characters
pH	8.28
Turbidity	185.1NTU
Electrical conductivity	8.56ms/cm

3.2 Process of Extracting Banana Stem Juice

Banana plants that had reached maturity were gathered.

After separating thrones and leaves from the stem. A mixer was used to grind the banana stem combine 100g of small fine pieces of pith with 10ml of distilled water. The juice was collected after mixed pith was strained. To keep the freshness of the extract of banana stem juice, it was stored in freezer at 7*(44.6f). Mix banana stem extract powder that is sundried/banana stem extract solution that is strained with the waste water sample collected. They are tested using the coagulation jar test, hardness using titration method, turbidity using turbidity meter/Neplometer, pH using pH meter and removing dye from waste water. To analyze the results obtained from the above tests conducted. One of the cellulose sources is the home waste referring to fruit and vegetable. Banana stems may be used as a cellulose source. Banana stem is essentially available. This has a tendency to be a waste problem. Let all. Confirmed that banana stem contained 38.12% of cellulose and 72.71% holocellulose wherein the holocellulose contained 71.76% of glucose (as the predominant monomer).



Fig 2 Banana Stem Juice



Fig 3 Banana Stem

3.3 Jar Test Apparatus

Coagulation and flocculation are crucial unit procedures wastewater remedy plants. The cause of coagulation/flocculation is to cast off turbidity, Coagulation entails the addition of chemical to destabilize the suspended particles, colloidal materials, and macromolecules. Jar take a look at equipment became decided on for use for coagulation sedimentation research. Time constraints followed in coagulation sedimentation research are; Rapid blending five min (a hundred rpm), slow blending-15min (a hundred thirty rpm) and Sedimentation 30 min.



Fig 4 Standard jar test

4. RESULTS AND DISCUSSION

The treated wastewater and were analyzed for various parameters such as pH, COD, Coagulation jar test, Hardness, Turbidity.

TABLE 2. PARAMETERS OF WASTE WATER.

SL NUMBER	PARAMETERS	WASTE WATER
1	pH	7.37
2	Electrical conductivity (ms/cm)	9.72
3	Jar test (NTU)	10.5
4	Turbidity test (NTU)	180 NTU
5	Hardness (mg/l)	0.01m
6	COD (mg/l)	10 mg/l

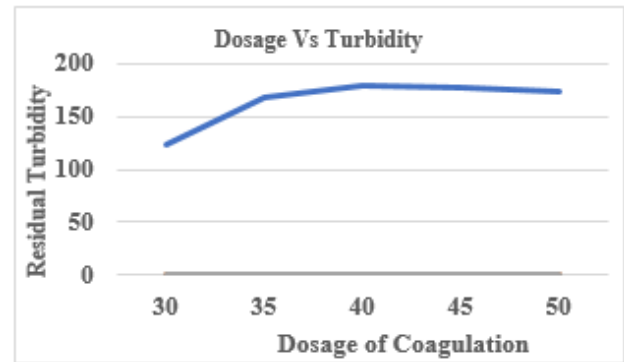


Fig ; 7 Variation of turbidity for different dosage of banana stem juice.

The coagulation of jar check outcomes as proven in determine fig7 .from the end result it's far referred to that fifty ml of organized banana stem extract is maximum appropriate for formation of flocs. It is sincerely discovered from the figure7.

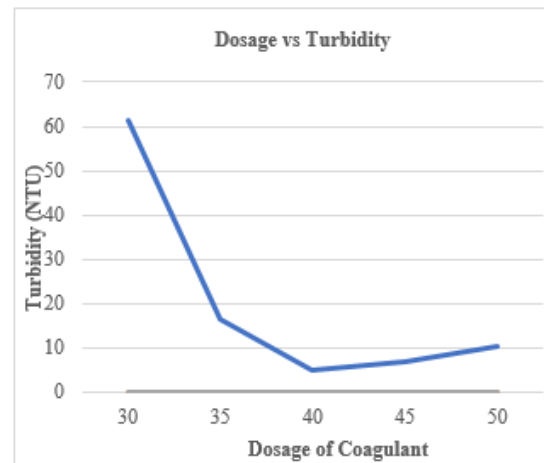


Fig 8 Variation of turbidity for different dosage of banana stem juice.

From the discern eight it's far be aware that there may be very steep decrease whilst the dosage of the banana stem juice is delivered more than ¼ of its volume.

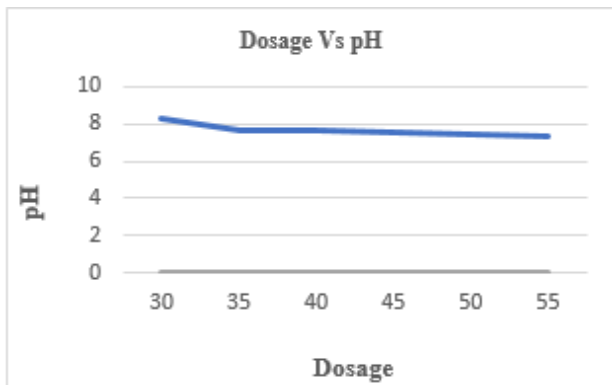


Fig 5 Variation of pH in different dosage of banana stem juice

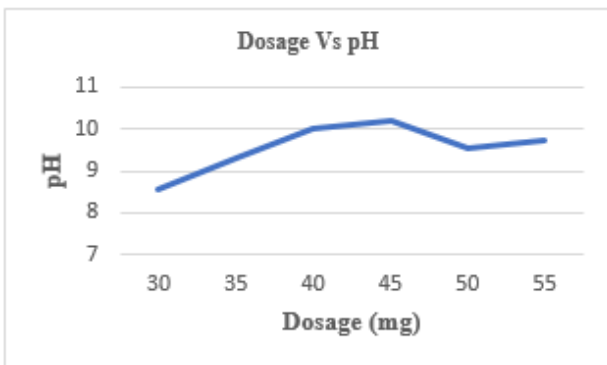


Fig 6 Variation of conductivity for different dosage of banana stem juice

5. CONCLUSION

- ❖ Banana stem extract juice is fed on approachable and green, an alternative choice to minor length water remedy
- ❖ Banana stem extract is a renewable supply that may be grown on a large scale
- ❖ It is green skill ability which has extra advantages greater than different remedy alternatives
- ❖ The banana stem extract juice do away with Hardness, Chlorides, and Residual chlorine
- ❖ The hardness of waste water is decreased at a percentage of 66% whilst banana stem extract is added at a percentage of ¼ of the amount of the waste water.
- ❖ The turbidity of the sample moreover decreased due to the more of banana stem extract through the proportion of 78% whilst 1/4th amount of banana stem extract that been added to the waste water.

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