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Industrial Waste Water Tretment Using Banana Stem Extract

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INDUSTRIAL WASTE WATER TRETMENT USING BANANA STEM EXTRACT

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ABSTRACT:

Water is one of the major consideration for economic improvement globally as it is extensively utilized in various productive zones which includes agricultural products, industry, and urban supply. The rapid-paced industrial development, financial growth, and inhabitants growth in emerging countries have involved in unexpected requirements 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 subtances whivh are are hamrmfull to environment and human health.The main aim of this paper is to analyze the effectiveness of banana stem extract in treating waste water collected from maharaja soap industry.. 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, Banana Stem extract, Low Cost Adsorbents ect.,

1.INTRODUCTION

The population of India is reached above 100 Cr. Now a days. Food, Cloth and Shelter are the basic needs for a human. So that the development of industries. As per statistics every district in India has minimum of 10 industries (Approximately). The production of requires a lot of fresh water that has to be used for irrigation purposes. A small scale industries uses 250 liters of water.

The waste water coming from the industries are simply doesn't have any characteristics that has to be used for the irrigation standards. The waste water coming out from the industry has large amount of Total Suspended solids, Hardness and other chemical parameters. This leads to the water is unsuitable for even irrigation standards. The waste created due to the dye to the dye from the textile industry leads not only high in Biological Oxygen Demand but also high in chemical oxygen demand. Due to the growth of textile industry, large amount of waste water contains the wastes coming from the dye industry creates different kinds of diseases to the Humans. This is the main reason to treat the waste water. However the treatment of waste water creates high cost due to the resource availability. This can be reduce by using natural adsorbents which are also known as low cost adsorbents.

The continuous use of water makes it impure so at the end of the use purification of water is essential. This purification is proceeding by different treatment given to the water. It has been found that in the developing countries more than 1.6 billion people are using the unhygienic water and among them most of the people suffers from diarrhea and other waterrelated diseases. Untreated the chemical compounds and pathogens in wastewater can harmthe health of animals, plants and birds that line in or near the water.

1.1 Maharaj Soaps Industry (P) LTD.

Maharaja soaps industry private limited (MSIPL) is known for its distinguished manufacturer and supplier of detergent soaps, powder & liquids. Maharaj industry was established in the year 2000 by Dr. Raviraja.M.E, chairman & managing director, after a successful year of journeys in 2010 it has become maharaj soaps industry private limited (MSIPL)

Fig1. Maharaj Soaps Industry(P)

Today the company offers a wide array of products to customers that are not only best in terms that are not only best in terms of quality and performance but also meet complete customer expectations.

The company has made its mark as a prominent provider of a diverse range of products and has been known for quality. Our company vigorously focuses on customer requirement and delight customer with its premium quality products. With this aim, it has successfully catered its products to customers which have been highly appreciated in the market. Maharaj soaps industry private limited is an unlisted private company incorporated on 29 September, 2009. It is classified as a private limited company and is located in Davanagere, Karnataka it is authorized share capital is INR 9.90cr and total paid up capitalis INR 7.75cr.

Effective- "we have invested years into scientific development to discover the right balance of planets and mineral based ingredients to insure safe and effective cleaning power our concentrated, non-toxic products are packed with powder and formulated to go beyond existing eco-friendly products and compete with conventional products.

2.OBJECTIVES

1. To enhance the properties of collected wastewater from Industry.
2. Addition of Banana stem juice as Addition a natural coagulant for the treatment of wastewater.
3. To study the various parameters such as Biological Oxygen Demand, pH, Chemical oxygen Demand, Hardness, and Turbidity of waste water collected from the soap Industry.
4. To recycle the waste water let out from the industries and make it suitable for otheruses 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 throns 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 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/nephlometer, pH using pH meter and removing dry from waste water. To analyse the results obtained from the above tests conducted.One of the cellulose sources is the domestic waste relating to fruit and vegetable. Banana stems can be used as a cellulose source. Banana stem is largely available. Thus, this tends to be a waste problem. Li et al. showed that banana stem contained 39.12% of cellulose and 72.71% holocellulose, in which 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 important unit processes in water and wastewater treatment plants. The purpose of coagulation/flocculation is to remove turbidity, Coagulation involves the addition of chemical to destabilize the suspended particles, colloidal materials, and macromolecules. Jar test apparatus was selected to be used for coagulation sedimentation studies. Time constraints fallowed in coagulation sedimentation studies are; Rapid mixing 5 min (100 rpm),Slow mixing-25min (130 rpm) and Sedimentation 30 min.

Fig 4 Standard jar test

4.RESULTS AND DISCUSSION

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

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

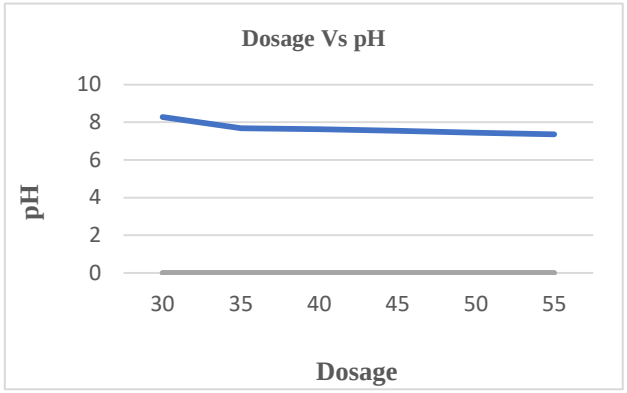


Fig 5 Variation of pH in different dosage of banana stem juice

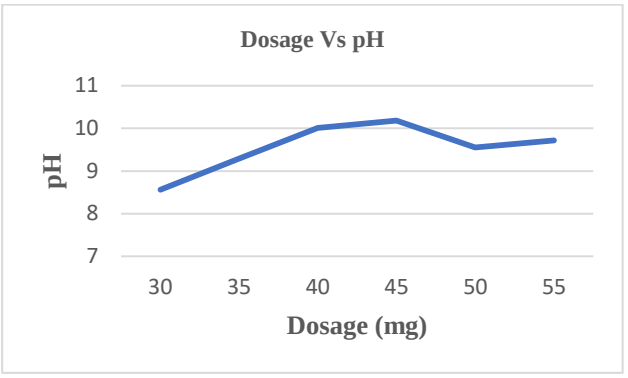
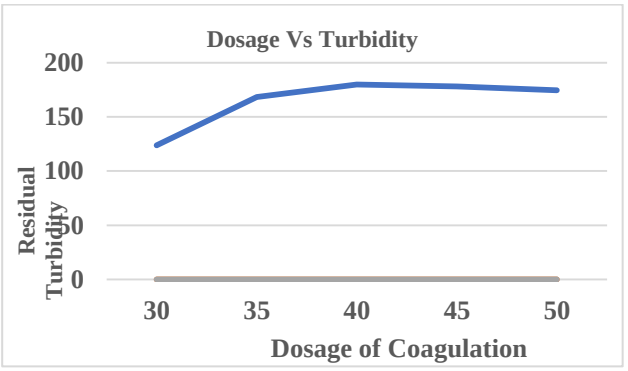


Fig 6 Variation of conductivity for different dosage of banana stem juice



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

From the coagulation of jar test results as shown in figure 7.from the result it is noted that 50 ml of prepared banana stem extract is most suitable for formation of flocs. It is clearly observed from the figure7.

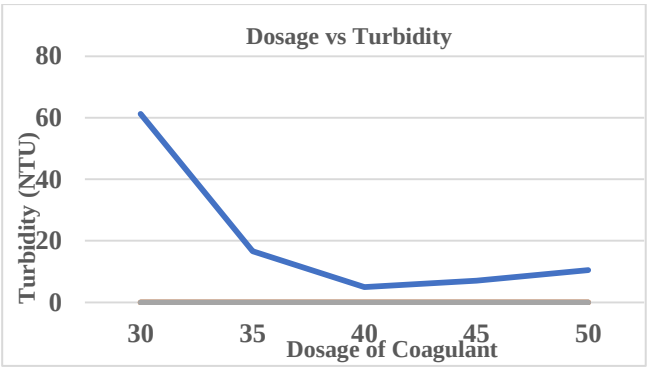


Fig 8 Variation of turbidity for different dosage of banana stem juice.

From the figure 8it is noted that there is very steep decrease when the dosage of the banana stem juice is added more that ¼ of its volume.

CONCLUSION

- From the experimental result it is concluded that the industrial waste water discharge has very high amount of suspended solid, hardness and turbidity value.
- The characteristics of waste water are almost similar in a particular stream when industrial waste discharged in to same stream.
- When banana stem extract is added to ¼ of the volume of the waste water the amount of suspended solids decreased at a percentage of 96% due to the adsorption capacity of the stem extract.
- The hardness of waste water is decreased at a percentage of 66% when banana stem extract is added at a percentage of ¼ of the volume of the waste water.
- The turbidity of the sample also decreased due to the additional of banana stem extract by the percentage of 78% when ¼ volume of banana stem extract that been added to the waste water.

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