

Reduction of Turbidity of Water Using Locally Available Natural Coagulant: A Review

Nischai Ravi¹, Rahul D Hemmady², Prajwal N³, Prajwal B⁴ and Prof. Tejaswini M

^{1,2,3,4} UG Students, Department of Civil Engineering, Dayananda Sagar College of Engineering, Kumarswamy Layout, Bengaluru

⁵ Assistant Professor, Department of Civil Engineering, Dayananda Sagar College of Engineering, Kumarswamy Layout, Bengaluru

Abstract - The potential of natural coagulants is highly sought nowadays as the use of commercial coagulants, aluminum sulphate (alum) affects the environment negatively. Hence an alternative coagulant is needed. Tamarind fruits are used for several nutritional and herbal purposes and the seed are disposed as waste. Antibacterial, antiviral as well as antifungal properties in addition to its coagulation potentials, tamarind seed and other parts of the plant showed a promising step in water treatment and purification and a potential solution to current problem in developing countries. Tamarind seed powder has the capability of reducing turbidity in raw water. The present review is expected to aid in the selection of appropriate technologies for surface water rejuvenation under varying conditions and would lead to an addition in the existing knowledge base on surface water remediation methods enabling further research in this domain.

organic compounds, zooplankton, phytoplankton and other microorganisms. Turbid water has cloudy appearance and makes it displeasing. Inorganic coagulants are more effective than organic coagulants, but in high doses, they may cause precipitates that are difficult to treat. This reason makes organic coagulant as an alternative to replace inorganic one. Naturally friendly organic polymers have been adopted for over the past 2000 years in most part of India, some part of Africa and China as effective coagulants and coagulant aids in water containing high turbidity. Natural coagulants have bright future and are concerned by many researchers because of their plentiful source, cost-effective, eco-friendly. Tamarind seeds have high protein. This protein acts as a natural polyelectrolyte whose utility is similar to synthetic or in other words the conventional one.

Key Words: Tamarind Seeds, Coagulation, Turbidity

1. INTRODUCTION

As climate change progresses, droughts are expected to increase in frequency and severity in many parts of the world. The potential future risks of climate change, as well as increasing demand for water resources, has led to increased investment in wastewater recycling as a means of decreasing reliance on ground and surface water sources. Turbidity and impurities in water is caused by suspended matter in the form of clay, silt, finely divided organic and inorganic matter, soluble color

1.3 OBJECTIVES AND SCOPES

1. To prepare the coagulant using tamarind seeds.
2. To determine the efficiency of sullage treatment using tamarind seeds as coagulant.
3. To determine overall costs of the treatment using tamarind seeds.

2 LITERATURE REVIEW

Md. Asrafuzzaman, A.N.M Fakhruddin:

Moringa oleifera cur Arsenicum, and Dolichos able were used as locally available natural coagulate in this study to reduce turbidity of synthetic water are carried out using artificial turf water with can test Apparatus of mixing intensity and duration were determined among all three cur Arsenicum which found most effective it upto 89% turbidity from the raw turbid water.

Md. Alamgir Hossain :

Traditional coagulants like seed powder of Lathyrus satirus and Pisum satirum are used as Natural coagulants. Seed powder of Lathyrus satirus and Pisum satirum could effectively replace synthetic coagulant aid polyacrylamide using these natural coagulant aids, suitable alternative and environmental friendly options for water treatment could be achieved. Banana peel can be used as a coagulant.

M. Priyatharishini:

Banana peel coagulant was highly feasible in removing turbidity of the synthetic wastewater with a removal efficiency of 88 % and their optimum condition.

A. Iqbal:

Medicago sativa, Dolichas lab pennisteam glucum and opurtia microdasys. Optimum doses for alum are 20mg/l, 50, 10, 50 optimum pH 6.5, 5, 6.5, 8.5 among all the above violence the most economically feasible coagulant was found out to be pennisteam glucum

Said S Mohammed:

T Indica fruit pulp extract has been efficiently used as natural coagulant It's use for turbidity removal achieved up to 99% efficiency hence it can serve a low-cost option for water purification

Lakshmi V :

Natural coagulants like boring size nanum tamarindus indica their efficiency in reducing turbidity of wastewater from some industries lakh was found 1.1 % at an optimum dose of mg per liter of tamarindus indica 85% in an optimum dose of 12 30 MG.

Sathish S :

Watermelon is the best natural coagulant that removes BOD, COD, PSS, and turbidity levels to a greater extent the efficiency of turbidity removal was 98 wastewater and 80 6.7% wastewater such as BOD, COD, and TSS wastewater was reduced to 54.9 6% COD removal efficiency was 10.19%.

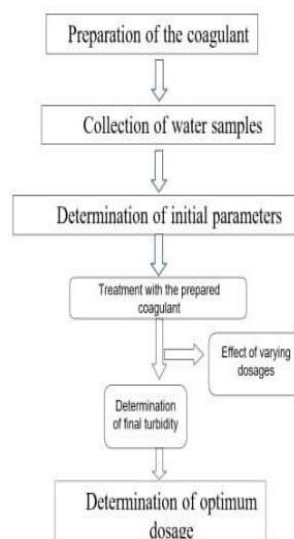
MR. Shoukath Ali KH :

Tamarind fruits are used for several nutritional and herbal purpose tamarind seed has the capability to reduce turbidity in raw water. The primary reason for using tamarind seed is that it is economical simple and requires less capital than the tested natural coagulant works better in low turbid water than high.

3.0 MATERIALS AND METHODOLOGY

Materials :

TAMARIND SEEDS



conduction of jar test the final turbidity of the water is determined by help of Nephelo-turbidity meter.

3. CONCLUSION

In this study, the natural coagulant was used for the treatment of sullage water. The primary reason being

it's economical, simple and requires less capital. In this investigation two different solvents such as water and NaCl with different concentration were used as extracting agent. The effect of coagulant dosage and pH were also studied. The results revealed that the tested natural coagulant works better in low turbid water than high due to limitation in coagulation mechanisms like hindered settling and Brownian movement makes natural coagulant unsuitable for high turbid. Low concentration of NaCl (0.5 M NaCl) seems to be suitable for extracting active-component from the natural coagulant thereby maximum removal of turbidity was observed, whereas high concentration of NaCl leads to the salting out effect. The maximum reduction of turbidity was observed at pH 7. Low and high pH condition is not suitable for coagulation, the reason being there is an imbalance of charged ions in the sample making it unsuitable. Thus, the natural tamarind seed can also be used as a coagulant to treat the turbid water.

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METHODOLOGY

Preparation Of Tamarind Seeds Powder:

1. The seeds are collected through various sources like local vendors or markets. The obtained seeds are sun - dried.
2. The sun - dried seeds are crushed using a miller.
3. The crushed seed powder is made to pass through 150 - micron sieves.
4. The powder is now ready for the analysis.

Extraction Of Active Components Of The Coagulant

1. The paste of tamarind seed powder is prepared with proper consistency.
2. This paste is later mixed with 0.5 M NaCl solution and stirred till the salt is dissolved.
3. The prepared solution is filtered through Whatman 41 filter paper.

Collection Of Sullage Water For our analysis we have considered the water from collected from kitchen and initial turbidity is known by using turbidity meter. Treatment Of Sullage Water:

1. The sullage water is treated by using the Jar Test Apparatus.
2. First, the initial turbidity of the water sample is determined by using the Nephelo turbidity meter.
3. The tamarind seed powder is added by varying the dosages. Determination Of Final Turbidity: After the

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