2026 Volume: 02 Issue: 03 www.ijrpa.com ISSN 2456-9995 Research Article

International Journal Research Publication Analysis

Page: 01-04

REMOVAL OF COLOUR FROM TEXTILE WASTE WATER USING AZADIRACTA INDICA AS NATURAL COAGULANT

Gavvala Rammohan[*1], S. Anjali[2], S. Vandana[3], K. Likhitha[4]

[*1]Assistant Professor, Department of Civil Engineering, Sanskrithi School of Engineering, Puttaparthi, Andhra Pradesh, India.

[2,3,4] UG Student, Department of Civil Engineering, Sanskrithi School of Engineering, Puttaparthi, Andhra Pradesh, India.

Article Received: 12 February 2026
Article Revised: 03 March 2026
Published on: 23 March 2026

***Corresponding Author: Gavvala Rammohan**
Assistant Professor, Department of Civil Engineering, Sanskrithi School of Engineering, Puttaparthi, Andhra Pradesh, India.

DOI: https://doi-doi.org/101555/ijrpa.7430

ABSTRACT

The wastewater generated by the textile industry is rated as the most polluting among all industrial sectors considering both volumes discharged and effluent composition. In present study the textile effluent was subjected for the colour removal by using natural coagulant Azadiracta indica. Azadiracta indica leaves treat water on two levels, acting both as a coagulant and an antimicrobial agent. It is generally accepted that Azadiracta indica works as a coagulant due to positively charged water – soluble proteins, which bind with negatively charged particles (silt, clay, bacteria, toxins etc) allowing the resulting "flocs" to settle to the bottom or be removed by Filtration. Also, the pH on colour removal was studied. pH and concentration of coagulant and time for treatment were found to be important factors in dye colour removal of textile effluent 2gm dose of Azadiracta indica at 7.3 pH for threes hour agitation time was found to be very effective for colour removal of text.

KEYWORDS: Natural coagulant, colour, Azadiracta indica.

1. INTRODUCTION

Growing awareness of pollution problems, dispersal of organic contamination in the environment is becoming a matter of concern. Ever increasing use of chemical and related compounds in each and every field of industry and agriculture summons an urgent need of method for their effective removal from water and wastewater. Synthetic dyes are an

important source of water pollutants that are recalcitrant in nature and difficult to degrade. Water pollution causes serious impacts on socio-economic prominence of the people. Azadiracta indica leaves treat water on two levels, acting both as a coagulant and an antimicrobial agent. It is generally accepted that Azadiracta indica works as a coagulant due to positively charged water – soluble proteins, which bind with negatively charged particles (silt, clay, bacteria, toxins etc) allowing the resulting "flocs" to settle to the bottom or be removed by Filtration.

2. METHODOLOGY

1. Collection of textile water samples

Water samples were collected from textile industry from Dharmavaram, Sri Sathya Sai district, Andhra Pradesh India. The samples were collected in clean polythene cans of 10 liters capacity. Proper care was taken during sampling with due consideration to the material of the container, gaseous exchange, sample analysis time, preservation required etc. The sample was collected from equalization tank of the treatment. The physic- chemical characteristics of collected waste water was analyzed in laboratory.

2. Preparation of natural coagulant

Azadiracta indica leaves were collected from Puttaparthi region. Leaves are removed from the branches and dried. Dried leaves are crushed and sieved (0.02 – 0.8 mm mesh or similar). The fine powder was prepared using mixer and it was used as natural coagulant.

3. Determination of pH, Turbidity, TSS and TDS

3. RESULTS AND DISCUSSION

4. Characterizations of textile effluent before treatment

SN.	Parameters	Values
1	pH	8.7
2	Turbidity (NTU)	47
3	TSS (mg/lit)	3700
4	TDS (mg/lit)	3900
5	Colour (mg/lit)	0.94

4. Effect of agitation time and dose concentration on colour removal after 1st hour.

Dose in gm	pH	Turbidity (NTU)	TSS (mg/lit)	TDS (mg/lit)	Colour (mg/lit)
1	6.3	21	1050	3200	0.72
2	6.1	17	900	2800	0.65
3	6.6	13	950	3600	0.62
4	6.75	12	700	4200	0.60

5. Effect of agitation time and dose concentration on colour removal after 2nd hour.

Dose in gm	pH	Turbidity (NTU)	TSS (mg/lit)	TDS (mg/lit)	Colour (mg/lit)
1	6.7	16	550	4220	0.42
2	7.2	14	400	5320	0.35
3	7.5	10	550	6600	0.22
4	7.5	09	680	7200	0.30

6. Effect of agitation time and dose concentration on colour removal after 3rd hour.

Dose in gm	pH	Turbidity (NTU)	TSS (mg/lit)	TDS (mg/lit)	Colour (mg/lit)
1	6.9	10	520	4200	0.22
2	7.3	03	380	6400	0.05
3	7.4	07	700	7200	0.12
4	7.7	09	780	8800	0.40

1. CONCLUSION

- The physio-chemical parameters of textile waste water before and after the treatment with Azadiracta indica as natural coagulant was analyzed during the study.
- From the study result it is concluded that the Azadiracta indica was found to be the best natural coagulant and found to be very effective for the color removal from waste water.
- pH and concentration of dose and time were found to be important factors in colour removal of effluent. 2gm dose of the Azadiracta indica powder at 7.3 pH for three-hour agitation time is very good for colour removal. TSS and TDS were found to be increase for some duration as addition of M. oleifera seeds in waste water but the color was removed from the effluent.

REFERENCES

1. Nath A, Mishra A, Pande P P 2020 A review natural coagulants in wastewater treatment.
2. Evaluation of Cactus and Hyacinth Bean Peels as Natural Coagulants, by Shilpa Bs in the year of 2012 june.
3. Vikashni Nand, Matakite Maata, Kanayathu Koshy, Subramanium Sotheewaran. “Water Purification using Moringa Oleifera and other Locally Available Seeds in Fiji for Heavy Metal Removal”,

4. Investigation of Coagulation Activity of Cactus Powder in Water Treatment, by Hayelom Dargo Beyene, Tessema Derbe Hailegebrial, Worku Batu Direrssa in the year of 2016.
5. Effective Waste Water Treatment by the Application of Natural Coagulants by Kartika Panwar, Itika Dadhich, Nagaraju Shaik in the year of 2021 June.
6. Evaluation of Cactus and Hyancinth bean peels as natural coagulants to treat Waste water (Municipal water), by B.S. Shilpa, Akanksha, Kavita, p. Girish in the year of 2012.
7. Wastewater (Industrial water)treatment using Bio-coagulant as cactus opuntia ficus indica by Saurabh O. Deshmukh, Dr. M. N. Hedaoo in the year of 2018.