



EXTRACT OF SAHIJAN (DRUMSTICK): AN APPROACH TO WATER DESSIPATION

Divya Mishra, Shailendra Pratap Singh, Sandhya Pandey and B.B. Biswas

Department of Zoology, P.P.N. (PG) College, Kanpur-208001

C.S.J.M. University, Kanpur (U.P.) India

E-mail: divyamishra0301@gmail.com

<https://doi.org/10.59436/jsiane.142.2583-2093>

Abstract

The water sample was collected from major five banks of river Ganga in Kanpur. The various physio-chemical parameters was applied to test the quality of water. It was found that the water quality was unpotable and not fit for daily uses. The seeds of *Moringa oleifera* was collected from Mangla Vihar area of Kanpur. The seed was shade-dried and extract was prepared with petroleum ether. The 10ml of the extract was used to treat 1000ml of sample water and the result was amazing. The extract was able to bind with individual particle of contaminants within 72 hrs. forming 'floc'. The bacteria and virus were enmeshed with floc in seven days. The water in 7 days became as clear as fresh water. This is cheap, edible indigenous natural product for water dissipation.

Keywords: *Moringa oleifera*, floc, dessipation.

Received 20.01.2022

Revised 15.02.2022

Accepted 01.03.2022

Introduction

The drumstick, *Moringa oleifera* Lam. (Moringaceae) common name Sahijan is middle sized graceful tree with cork bark and easily breakable branches. Leaves usually tripinnate rachis slender, thickened and articulated at the base, leaflets elliptic. Flower white enlarged and seeds trigamous, the angles winged. The trees are remarkably fast growing even on nutrient deficient soil. The trees has remarkable medicinal value. The leaves are anti-inflammatory, antihelmentic. The bark is acrid, thermogenic and antifungal. The roots are carminative digestive. Flowers toxic, diuretic. The seeds are antipyretic and oil form seeds is known as 'Behen oil' with 40% solid fat seed also have water soluble proteins that are able to bind particles of any material. On basis of this property seeds are utilized as water purifier. Kanpur is major city situated at the bank of river Ganga. It is one of the major producer of leather making with a lots of tanneries that are mainly responsible for unpure water. In present study sample from five major bank had been taken for treatment. Since drumstick is edible, it has advantage over chemical treatment. According to (Bansode, 2012) removal of hardness of water has shown the efficiency of shaijan. In addition, drumstick has also shown the

purifying powers by flocculating gram positive and gram negative bacterial cell.

Materials and Methods

The seed pods of *M. oleifera* were collected during March-April (2021) from Mangla Vihar of Kanpur district of Uttar Pradesh. The collected material were dried at room temperature ($28 \pm 2^{\circ}\text{C}$) and were grind mechanically with grinder. The material was extracted through soxlet apparatus with petroleum ether as solvent in 3:1 proportion at 30°C . The solvent was removed at 40°C on water bath and dried in desiccators, thus pure active compound was obtained. The five water samples were collected from Jajmau Ghat, Parmat Ghat, Dhori Ghat, Shuklaganj Ghat and Bithoor Ghat where the drains meet the river. The sample were collected without floating material and sealed in plastic bottle of 2 litres. For biological examinations the samples were collected in sterilized neutral glass stoppered bottles of 250ml. The untreated and treated water samples were analysed in laboratory of P.P.N. College, Kanpur, the various pollution parameters like BOD, COD, Turbidity Coliform, pH, SS (acid suspended) DS (solid present in solution) (Patel, 2017).

The 10ml of drumstick extract was mixed with 1000ml of water sample and shaken vigorously. The mixture was allowed to stand for 6 hours and all the undesirable suspended particles settled out under gravity and were filtered on fifth day, the water was again passed through all analysis as described in table 1. The data were tabulated and these values were compared with untreated water. The methods used for physico-chemical study of raw water and treated water has given in table 2.

Results and Discussion

The untreated water was pale yellow having fishy smell and pungent taste. The value of BOD, SS and nitrogen were giving clear evidences of organic pollution. The value of BOD and MPN coliform were much beyond the permissible limits and water as such are not suitable for drinking purpose. The values of heavy metal were also beyond the limit and water could not be recommended for drinking even by animals. Brisk reaction was observed when the seed extract was mixed with collected water samples. The active

principles of extract were able to bind with individual particle of contaminants within 72 hrs. forming a 'floc'. Bacteria and virus were enmeshed in floc and after 7 days of slow mixing all the undesirable suspended particles scattered down and water become as clear as fresh.

The comparative analytical data obtained from water samples (Table 2) revealed that all most all major characters of treated water were within permissible limit. Thus water can be recommended for bathing, drinking agriculture purpose. The result suggested that this strong cheap indigenous natural product can easily be used for removal of water pollutant. The sahijan can be planted near the edges of natural water resources.

Table 1: Method used for physico-chemical study of raw water & treated water.

S. No.	Parameter	Method
1	pH	pH meter
2	Turbidity	Nepelometer
3	TS	Evaporation
4	Colour	View
5	DO	Titration method
6	BOD	Titration method
7	Alkalinity	Titration method
8	Chloride	Titration method
9	Hardness	Titration method
10	Nitrogen	Titration method

Table 2: Results obtained with methods used for physico-chemical study of raw water and treated water.

Physical/ chemical & microbiological	Treated	Jajmau	Parmatghat	Dohrighat	Shuklaganj	Bithoor
Colour	Transparent	Pale Yellow	Yellow	Transparent	Pale Yellow	Yellow
pH	7.15	8.22	8.28	7.80	8.3	7.2
Temp	28	31	30	29	28.7	30.12
BOD	1.49	4.2	3.8	2.82	5.30	3.2
Turbidity	0.83	6.2	5.8	4.2	3.8	4.5
Total residue	176.23	215.33	190	220	215	180
Filterable residue	118.22	56.42	140	135	145	132
Non-filterable residue	0.02712	61.32	51.24	40.12	55.8	62.5
Cl	2.35	12.5	10.6	8.25	11	9.61
Total hydrogen	0.8	2.45	1.84	2.38	3.16	1.72
Dissolved oxygen	12.25	8.2	9.5	7.35	11.0	9.8
Chromium	0.003	0.07	0.02	0.01	0.09	0.03
Nitrogen	1.14	1.5	1.8	1.2	2.2	1.65

References

- Afolabi Ag., Obuyamo S.S., Fuwape I.A. "Systematic Characterization and Structural Properties of Nanocellulose from *Moringa oleifera* seeds" Journal of the Vegerian Society of Physial Sciences, Aug., 2021, 3(3) : 8.
- Choudhary A., Sharma A., Tara N., Rathi G., Abdulla N.K., Khan Sajed A.M., Chaudhary S.A. "Phytogenic plant based nano composites for water treatment, 2021, 485-493.
- Eman N. Ali, Suleyman A., Muyeir, Hamzah M. Sallam, Mohd. Rahman, M Sallehand M.D. Zahagir Alam, "Moringa oleifera seeds as Natural coagulant for water treatment", Indian International Water Technology Conference, 2009.
- Eman N. Ali., Suleyman A., Mohd. Rehman M., Hanzah M.S. Alam S.Z. "Moringa oleifera seeds as natural coagulant for water treatment" Thirteen International Water Technology Conference", 2009.
- Karri Vasau Rama, Samiwala N, Kothapalli L., "Effect of powdered Moringa oleifera seeds on the characteristic of surface water" Ind. J. App. Reas. Oct, 2015, 5(10). 568-572.
- Mangale S.N., Chande S.G., Jadhav A.S., Raut P.D. "Study of *Moringa oleifera* (Drumstick) seed as natural absorbent and antimicrobial agent for river treatment", J. Nat. Prod. Plant Resour., 2012, 2 (1) : 89-100.
- Muhammad G., Mehmood A., Shahed M., Ashraf R.S., Altaf M., Hussain M.A., Raza M.A. "Biochemical Methods for water purification, 2020.
- Patil Rohan R., Jagadale Suryakant S., Gaikwad Aniket A., Mane Aniket V., "Moringa oleifera (Drumstick) seed as natural coagulant for Well and Bore Well Water Treatment International, J. of Eng. Res. and Tec. Nov. 1 (2017), Vol. 10, 336-340.
- Pese C.P., Gidde N.R., Bhalerao A.R., "Study of blended coagulant Alum and *Moringa oleifera* for turbidity removal" J. Env. Res. Dev., Vol. 4, No.2, 2009.

- Pese C.P., Halkude S.A., "A new technique for purification of water using natural coagulant", Int. J. of Eng. & Tech. Vol. 6. No. 6., 2015.
- Rohit K.R., Padil V.T., Waclavek S., Cernik M., Varma R.S. "Eco-friendly and Economic, Adsorptive Removal of Cationic and Anionic Dyes by Bio-Based Karaya Gum-Chitosan Sponge 2021, Polymer, 13(2).
- Sutherland J.P., Folkard G.K., Grent W.O. "Natural Coagulants for Appropriate Water Treatment : A Novel Approach" Waterlines, Vol. 8, No. 4, 1990.
- Wei Qu., Dcliang He, Yanni Guo., Yining Tang, Jun Shang, Lei Zhou, Ribong Zhu, Ren-Jee Song" Modified water hyacinth functionalized with citric acid as an effective and Inexpensive Absorbent for Heavy Metal ion Removal, Industrial & Engineering Chemistry Research 2019, 58(40), 18508-18518.