RESEARCH ON GUTTER H2O TREATMENT USING ORGANIC ABSORBENT (CALOTROPIS GIGANTEA)

M. Ranjitham[1], M. Ajith Kumar[2], S.K. Dharani[3], S. Kaasurajan[4]

[1]Assistant Professor, Department of Civil Engineering, Bannari Amman institute of technology, Erode, Tamil Nadu, India
[2,3,4]Student, Department of Civil Engineering, Bannari Amman institute of technology, Erode, Tamil Nadu, India

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ABSTRACT: *Despite of more population and the growth of science and technology made an consequential impact on the environment by polluting the water. Water is the main source of all living organism. So we done a project regarding treating the sewage water of our campus by using the calotropis gigantea(grown flower). The sludge contains heavy metals during water treatment plant the dioxins are separated which is very harmful. In spite of treating sewage water it also helps in the expulsion of textile effluent. It is cost effective and economical.*

In calotropsis gigantea(ARKA) latex-which is used in the form of activated carbon for absorbing impurities in the waste water. we made certain parameters for the identification of pH, Hardness, chloride content, sulphate content, nitrate, alkalinity and chemical oxygen demand. In this project we have concluded that it will be more effective in future to meet the demand of water.

KEYWORDS: *calotropis gigantea*(grown flower), dioxins, pH, chloride content, sulphate content.

INTRODUCTION:

Gutters prevent water ingress into the fabric of the building by channeling the rainwater away from the exterior of the walls and their foundations.Water running down the walls causes dampness in the affected rooms and provides a favourable environment for growth of mould, and wet rot in timber. How is your water? This friendly greeting, common in ancient and indigenous cultures, shows the importance of clean water. The health of the water you are taking is vital for our well- being. It is the same for the environment as a whole. In addition to serving as the basic requirements for humans and ecosystem, water also acts as a sink, solvent and transport vehicle for domestic, agriculture an industrial waste, causing pollution. Industrial development has caused pollution of water through history and this is very much the reality in the town of Sathyamangalam in southern India. Cleaning technology has not kept pace with the use of toxic chemicals in the many textile industries in and around the city. Over 700 bleaching and dyeing units ,the two most water and chemical consuming industries in textile production chain, let out virtually all effluent's in to the Gutter water which flows through sathyamangalam. Detouring water quality it threatens human health and aquatic eco systems and increase competition of water. There are several efficient and successful methods to remove heavy metals like Sulphur, chlorides, heavy etc..., but the process of efficient colour removal is in growing pace. Thus the biosorption technique proves to be economic and efficient solution.

MATERIALS AND METHODS

Water Samples and Analysis

The study area comprises of the residential campus of Bannari Amman Institute of Technology, Sathyamangalam (Lat11.49520 and Long 77.27640), Tamil Nadu, India. Composite Gutter water samples were collected from the Sewage treatment plant. Variation in Quality and its characteristics behavior when exposed to chemical conditions.

Fig:-1 *(Gutter water)*

About Absorbent & Uses

In ancient ayurvedic medicine the plant Calotropis gigantea is known as "Sweta Arka" and Caotropis procera as "Raktha Arka". Both of them are often similar in their botanical aspects and also have similar pharmacological effects

Fig :-2 *(Calotropis latex)*

Fig:-3*(Calotropis gigantea)*

CALATROPIS GIGANTEA:

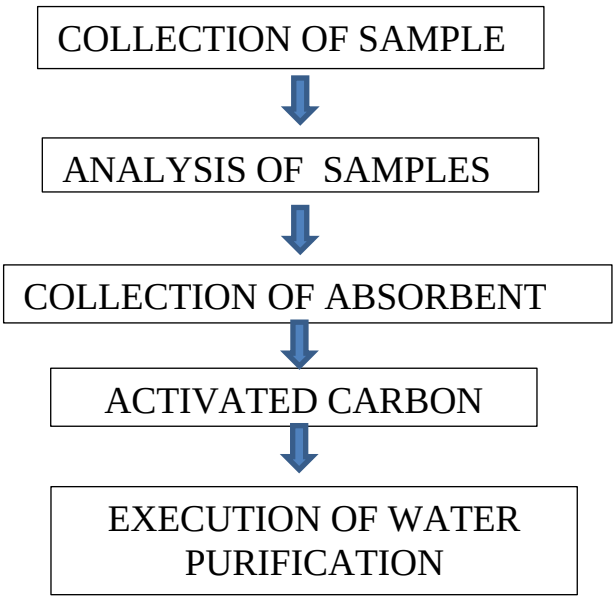
Calotropis native to Cambodia, Indonesia, Malaysia, the Philippines, Thailand, Sri Lanka, India, China, Pakistan, Nepal, Booc Booc in Somalia and tropical Africa. From pre-historic times to the modern era in many parts of the world and India, plants, animals and other natural objects have profound influence on culture and civilization of man. Since the beginning of civilization, human beings have worshiped plants and such plants are conserved as a genetic resource and used as food, fodder, fibre, fertilizer, fuel, febrifuge and in every other way Calotropis gigantea is one such plant and we are using this plant for the purification & colour removal process because the activated carbon of this plant acts as the adsorbent.

SYSTEMATIC POSITION 0F THE SELECTED PLANT:

Kingdom	Plantae
Order	Gentianales
Family	Asclepiadaceae
Sub family	Asclepiadoideae
Genus	Calotropis
Species	Gigantea

Fig 4: *Organic Absorbent*

METHODOLOGY:



The initial consideration before the experiment to be started were as follows: The Gutter water sample of 5lit is collected from the Sewage treatment plant of Bannari Amman Institute of Technology for our experiment. Then the standard water parameter tests were conducted gutter water sample. After that the collection of absorbent were done .



Fig 5,6& 7*(Collection of latex)*

COLLECTION OF LATEX:-

- The adsorbent (calotropis latex) was collected from the aerial parts of the healthy plants by using razor blades.
- The latex mixture was gently handled to maintain its uniformity for testing.

Fig 8 : Activated Carbon

TESTS FOR ADSORBENT:

The physical characteristics of adsorbent are analyzed such as:

Parameters	Observations
Colour	White
Odour	Pungent
Particle Size	125µm

EXTRACTION PROCESS OF ADSORBENT (CALOTROPIS GIGANTEA):

After the collection of adsorbent (calotropis lactum) from the local area it is kept cool for further extraction to be done. The extraction is the process of converting the raw materials into powdered form of activated carbon. This is done by using the muffle furnace of 550 for the period of 15 minutes and the fine powdered of activated carbon is obtained by cooling it in a desiccators and crushed to obtain the powdered form .To get the same particle size distribution of adsorbent 125 micron sieve is used .

WATER QUALITY PARAMETERS OF GUTTER WATER

Characteristics	Unit	Result	Standard
pH	-	8.79	6.6-7.5
Colour	-	Grayish brown	-
odour	-	Objectionable	-
Temperature	-	34^0C	40^0C
Sulphate	Mg/l	1721	1000
Chloride	Mg/l	300	1000
Nitrite	Mg/l	0.8	-
COD	Mg/l	600	250
Total hardness	Mg/l	363	300
Alkanity	Mg/l	800	-

CONCLUSION:

These results are important in understanding the water parameters present in Gutter water. As demand for water increases, water managers and planners need to look widely for ways to improve water management and augment water supplies. Treated municipal Gutter water is by far the most consistent impaired-quality water source, both spatially and temporally and in terms of quality and quantity. One exception to this generalization is Gutter water commingled in a combined Gutter water collection system, and another occurs when industrial Gutter water is discharged to the municipal Gutter water collection system. The quality of treated municipal Gutter water has been characterized for various levels of treatment to meet regulations pertaining to the disposal of sewage effluent and to allow use of the effluent for recharge and other purposes. The characterization of the quality of stormwater runoff and irrigation return flow is far less comprehensive because general assessments of stormwater and irrigation flow quality must be drawn from a much less systematic and comprehensive database than is available for treated municipal Gutter water.The disposal of flow patterns and local hydrodynamics in any multiphase flow system. In this study, multi-phase fluid flow in porous media at different

levels of saturation were investigated by experimental methods by developing drainage and imbibition curves. The resulting graph represents the systemic response of variation in pressure on degree of saturation. Based on the nature of the organic soil used, the change in pressure is observed to be limited due to the typical textural composition unlike the impact on porosity and permeability. The model has been successfully constructed and tested both experimentally and analytically.

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