



# **Sadakathullah Appa College**

## **(Autonomous)**

(Reaccredited by NAAC at an 'A' Grade. An ISO 9001:2015 Certified Institution)  
Affiliated to Manonmaniam Sundaranar University, Tirunelveli, Tamil Nadu.

### **CRITERION III**

#### **RESEARCH, INNOVATION AND EXTENSION**

##### **3.1.2 Provision of Seed Money to Teachers**

#### **Sample Report**

*Submitted to*

**THE NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL  
(NAAC)**

**August 2022**

**Phytoremediation of waste water generated from our college using  
*Ocimum sanctum*, *Cymbopogon citrates* and *Aloe barbadensis*, reusing for  
domestic purposes**

**SAC/Research Project/ Seed Money/ 2019-20/17**

**SAC-UA/CHE/01**

**Final report**

**Submitted To**

**Sadakathullah Appa College (Autonomous)**

**Reaccredited by NAAC with 'A' Grade**

**Tirunelveli- 627 011**

**Tamilnadu**



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**Reaccredited by NAAC with 'A' Grade**

## DECLARATION AND CERTIFICATE

I hereby declare and certify that, the Research Project entitled **“Phytoremediation of waste water generated from our college using *Ocimum sanctum*, *Cymbopogon citrates* and *Aloe barbadensis*, reusing for domestic purposes” SAC/Research Project/ Seed Money/ 2019-20/17, SAC-UA/CHE/01** is a bonafide record of research work carried out by me during the year 2019- 2020. Further certify that the work presented in the report is original and carried out according to the plan in the proposal.

M.A.Sa  
Principal Investigator

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dissolved solids. The study has paved way for the effective treatment of laboratory waste water. The method was novel and cost effective.

## 2. Introduction

Every natural response happen in water and it is the coordinated arrangement of organic metabolic responses in a fluid arrangement that is fundamental for the support of life. Human beings rely on water in one manner or other. It might be noticed that man's initial home and human advancement jumped up along the banks of waterways. In spite of the fact that the outside of our planet is about 71% water, just 3% of it is new. Of these 3% about 75% is tied up in icy masses and polar ice sheets, 24% in groundwater and 1% is accessible as new water in streams, lakes and lakes appropriate for human utilization (Dugan, 1972).

India faces a serious threat due to water pollution. Nearly 70% of surface water resources and groundwater reserves are contaminated by tones of various pollutants. These resources become unsafe for human consumption as well as for other activities. Because of the degradation of water quality, it will lead to water scarcity. In India, the Central Pollution Control Board (CPCB) in the year 1995 predicted that 18 major rivers are severely polluted. All these rivers run through urban area.

Wastes created in households, sewage, effluents from industries and agriculture run off pollutes the water resources. These wastes are loaded with chemicals and toxic substances which affect animals, plants and human beings. Solid wastes dumped in rivers and lakes affect the aquatic life. Due to the spilling of oil in sea pollutes the water becomes toxic for aquatic lives.

Iron coagulants are ferric sulphate ( $\text{Fe}_2(\text{SO}_4)_3$ ), ferrous sulphate ( $\text{FeSO}_4$ ) and ferric chloride ( $\text{FeCl}_3$ ). Iron compounds are generally cheaper, produce a heavier flocculent and perform over a wider pH range than aluminium coagulants. However, iron coagulants are not used as much as aluminium due to staining equipment, corrosiveness, and they require more alkalinity than alum.

Although water treatment chemicals are effective and used worldwide, scientific evidence shows that exposure to chemicals during coagulation with metal salts could be associated with adverse health effects (Hahn and Kunte, 1990). Aluminium, which is the

value of 0.2- 0.3µg/l and < 10 µg/l respectively. Also aluminium concentration was reduced from 0.23 mg/l to 0.15mg/l.

The study has paved way for the effective treatment of laboratory waste water. The method was novel and cost effective.

## 7. Conclusion

The increasing population and the demand for underground water have created awareness for rain water harvesting and search of new techniques to reuse waste water. This methodology of using *Ocimum sanctum*, *Cymbopogon citratus* (Lemon Grass) and *Aloe barbadensis miller* for purification of most polluted laboratory waste water was cost effective and efficient. It can be applied to purify any water and the water can be used for domestic purpose. The proposed work can be extended to large scale waste water purification by constructing water tank made with three layers of sand and pebbles, sand and ceramic membrane coated with *Ocimum sanctum*, *Cymbopogon citratus* (Lemon Grass) and *Aloe barbadensis miller* leaf powders.

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## 9. Summary

World Health Organization report says that by 2025, half of the people will live in water stressed areas. Developing countries like India comprises of people belonging to various sectors. Most population live in below poverty level. The increased pollution load makes it impossible for availability of water for domestic purposes. The effluents from

industries are treated which involve high cost methods. Hence most of the industries release their effluent without treatment into the water bodies. The usage of the polluted water causes various diseases. To overcome water scarcity and reuse of waste water, a cost effective, economic method is needed. This proposed project paved way for efficient, low cost and effective methodology for treatment of waste water without leaving toxic byproducts. The raw materials required are only the plants which can be grown in our premises. The leaves of plants like *Ocimum sanctum*, *Cymbopogon citrates* and *Aloe barbadensis* can be used to treat waste water. It will reduce the cost of buying water and also it can be conveniently set up to meet the needs of the college. The future perception of this project is to establish this set up in other colleges on contract basis which will earn income for our college and also prove our aim of conserving the Mother Nature. The result shows much reduction in metals and pH. The high percentage of reduction enables the reuse of water effectively. The bioadsorbents can effectively used to reduce the concentrations of micro nutrients and also trace elements. Concentration of beryllium and nickel were decreased to permissible limit. Similarly the concentrations of silver and molybdenum were declined below the limiting value. The study has paved way for the effective treatment of laboratory waste water. The method was novel and cost effective.



  
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