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A FEASIBILITY STUDY OF DEVELOPMENT OF LOW COST WATER FILTER USING HERBAL TECHNIQUE

Rajani V. Kulgude
Asst. Prof Civil Engineering Dept.
Dr.D.Y.Patil College of Engineering & Innovation, Varale, Pune,MH,India
rajanikulgude01@gmail.com

Prashant S. Chigle
Department of civil Engineering
Dr.D.Y.Patil College of Engineering & Innovation,Varale
Pune,MH,India

Akshay S. Bhagat
Department of civil Engineering
Dr.D.Y.Patil College of Engineering & Innovation,Varale
Pune,MH,India

Santosh B. Ghumare
Department of civil Engineering
Dr.D.Y.Patil College of Engineering & Innovation,Varale Pune,MH,India

ABSTRACT— It is well known fact that clean water is absolutely necessary for healthy living. Sufficient supply of fresh and clean drinking water is a basic need for all peoples on the earth, yet it has been observed that millions of people world wise are disaffected of this. Clean water use being prime things in many communities of developing countries. Polluted water plays significant role in taking numerous lives in these localities, for which a number of efforts are being made for working into safe purified drinking water. Fortunately, useful and cheap water purification systems are being utilized and being tried to be work worldwide for easy access to clean water. Natural herbs like Tulsi, Neem, Amla, Wheatgrass etc. are effective in water purification because of their antibacterial activity. Also these herbs are widely used as medicine for human with no side effects. Hence this study was done to evaluate effectiveness of Tulsi, Neem and Amla in water purification; especially with antibacterial activity.

Keywords—Neem, Tulsi, Rice Husk, Sugarcane bagasse, Chuna.

I. INTRODUCTION

Water is basic necessity of man along with food and air. Natural water resources usually available are rivers, lakes and underground water reservoirs. About 71% planet is covered with water, yet of all of that 96.5% planets water is found in oceans, 1.7% in underground, 1.7% in glaciers and the ice caps and 0.001% in the air as fog and clouds. Only 2.5% earth's water is fresh water and 98.8% of that is in ice and underground .Less than 1% of all fresh water is in rivers, lakes and atmosphere.

Unsafe drinking water may result in serious health problems and harmless diseases. According world health organization 1.1 billion people lake access to an improved drinking water supply, 88 % of the 4 billion cases of diarrhea disease are attributed to unsafe drinking water and 1.8 billion people die from diarrhea diseases each year (WHO, 2007). Statistics shows that these diseases resulted in 90% of all deaths of children under five years old in developing countries, due to low immunization of children to infections. Decreasing death from water borne diseases is a major goal of public health in developing country. Although of fulfillment of requirement of drinking water standards, the municipal water in used in developing countries is being improved and cost efficient water filtration techniques are being developed commonly used to improve taste or to discard any undesired matters.

In the past, various types of filters have been designed to be more useful for the rural areas of the countries, but the cost as well as the filter capacity is still not comfortable and further improvement is still required. Drinking water is being the biggest issue now days in India. Most of the people in the rural areas are not able to use water filters or buy mineral water bottles. To beaten this problem many efforts have been done due to which cleaning water may become an affordable commodity. Every household should be able to develop its own drinking water purification system; this should be the aim of development of any low cost water purification technique. In this conditions a number of contributions that has been made where the filter media varies from a layer of simple cotton cloth to composite nano materials.

II. MATERIALS

A) Tulsi leaves powder: The scientific name of Tulsi is Holy basil or Ocimum Sanctum Linn. Leaves are released in drinking water for purification and for medication. In all Hindu temples, water mixed with Tulsi leaves are offered to follower every day since the herbal plant is an best medicinal plant found all over India and is considered sacred. The leaves, seeds and roots of Tulsi have been used in ayurvedic medicine. It can remove fluoride levels in drinking water.

B) Neem leaves powder: The scientific name of neem is Azadirachta indicia. Neem leaf powder was buy from the local market. Neem leaves powder was used for removal of toxic element from water.

C) Rice husk**:** Rice husk are the hard protecting covering of grains of rice. Scientific name for rice is oryza sativa. Rice huk is used as adsorbent along with sand as a base material.

D) Aluminum hydroxide coated Rise husk Ash**:** Rice husk ash (RHA) is generated by burning rice husk. Rice hush ash was prepared by controlled temperature and environment of burning process in muffle furnace at a temperature of 500 degree Celsius for 3 hours. This is used as an adsorbent along with sand as a base material.

E) Sugarcane Bagasse**:** Bagasse is sugarcane fiber waste left after juice extraction. Bagasse contains mainly cellulose, hemi cellulose, lignin, sugars, wax and minerals. It was first washed completely with tap water and again washed with distilled water to remove dirt and metallic impurities and after which it was dried in the oven at 105 degree Celsius for 3 hours and 24 hours dried in sun light. It is used as an adsorbent along with sand as a base material.

III. LITERATURE SURVEY

In this paper the study is carried out on disinfection of drinking water in rural area using natural herbs. Tulsi leaf and neem leaf used for purify of water and check coli form reduction in water samples by aqueous leaf extract, Alcoholic leaf extract and Fresh leaf juice.[2]

In this paper author studied the removal of fluoride from groundwater is carried out by aluminum hydroxide coated Rice husk ash. Activated aluminum hydroxide has been used for stimulate the RHA surface which forms a complex with fluoride ion in water and accelerates the process of removal. RHA was obtained by controlled burning of dry and break rice husk and treating with hydrochloric acid before activation.[1]

In this paper authors studied on Neem leaves powder used as low cost absorbent and its characteristics. It has been used successfully in the removal of impurities from effluents.[6]

In this paper authors studied about the removal of chromium from an aqueous solution using Neem leaf powder as an absorbent. Neem leaf powder is used as an absorbent for the removal of chromium from aqueous solution.[7]

Author's paper deals with removal of cadmium from aqueous solution by adsorption on to sugarcane bagasse. In this paper, cadmium removed by sugarcane bagasse from aqueous solution. Process for removal cd, investigated through batch experiments. First experiment of preparation of synthesis waste water and absorption experiment. The absorption processes was relatively fast and equilibrium was achieved after some duration.[8]

IV. METHODOLOGY

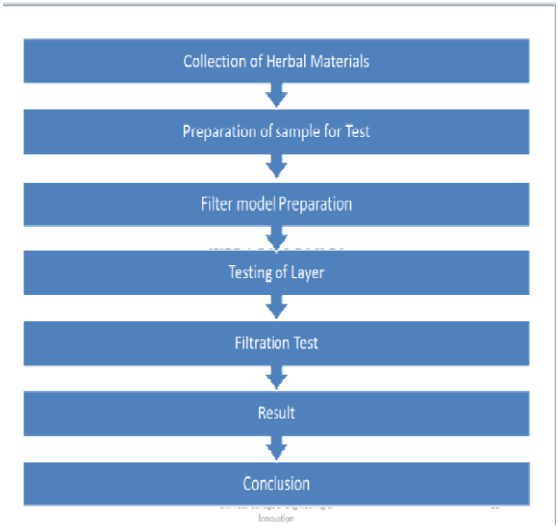

Fig .1 Flowchart of Methodology

V. CONCLUSION

From the study of all literature review it is observed that in rural area, the peoples are using the water from well or any other sources of water without any treatment. These natural herbs used in this study can be efficiently use as a disinfectant. Using these cleaning agents, pathogenic bacteria from the water can be killed and made water safe for the user. The major population of our country is living in rural area, where these natural herbs are easily available. Especially Tulsi, Neem and Wheatgrass were found most active for antibacterial activity in water purification.

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