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Review on purification of drinking water

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Abstract
India is a developing country and it faces many types of problem in which main problem is water resources. This topic has been carried for improve the quality of water that we use for drinking. To pure the water we use some natural resources like plant extracts of *Moringa oleifera*, *Arachis hypogaea* [peanuts] *Vigna unguiculata* [cowpeas], *Vigna mungo* [ured] and *Zea mays* [corn]. When all of these plants are examined on water, result showed the significant decreased in the reduction of micro counts up to 90%. Coagulation of the heavy metal like lead, copper, nickel etc. is also done by treatment of water with these natural extracts. Everything is useful in these plants because it has been examined that seeds and leaves were also more effective in clearing and in sedimentation of suspected organic and inorganic matter present in water samples. In treated water samples, total bacteria count was found 10 cfu / ml but in control water sample was found more then1000 cfu / ml. 90% of heavy metals were also removed in treated samples. This work evaluates the use of plants, which an economical and eco-friendly.

Keywords: optimization, PH scaling, turbidity removal, water treatment

Introduction
Water is useful for many purposes like in drinking, in agriculture purpose, domestic purpose, industrial purpose etc. World health organization WHO [1971], reports that wholesomeness of water means absence of suspected solids, inorganic solids and pathogens. There are about 71% of earth is covered by water in which 96.5% water found in oceans [8], 1.7% in ground water, 1.7% in glaciers and the icecaps of Antarctica and Greenland, a small fraction in other large water bodies and 0.003% in the air as vapor clouds and precipitation only 2.5% of earth water is fresh water and 98.8 %of the that water is in ice and groundwater is less than 0.3% of all freshwater is in rivers lakes and the atmosphere and an even smaller amount of the earth's freshwater [0.003%] is contained. Within is essential to humans and other life forms even through it provides no calories or organic nutrients [1]. Underground water is being affected due to increasing amount of sewage progressing urbanization, the chemicalization of agriculture and industry and anthropogenic activities. Final effect of water degradation is the limits as to the use of drinking water reservoirs. Frequently this state is coupled with microorganisms detrimental to underground waters through the soils hence; these bacteria may become the source of various diseases, intensity of which would largely depend on microorganism pathogen city and disease potential [12]. Many bacteria is threat to human due to their ability to multiply the drinking waters others, especially those which constitute natural micro flora of human and animal food tracts, can induce acuter chronic gastric diseases. An engineering team resolves the problem of water at global level. They use the method for water purification called Electro-dialysis [4]. They made a device in which they add an solar penal at the top of a water tank where all the sun light convert in electricity that flow into small wires that placed at bottom and around of the tank that liberates heat and this het is use for boiling of water. This process is used in the entire world now-a-days.

Due to lack of monitoring facilities pollution of surface and ground water from agriculture, domestic and industrial activities has not been recorded and monitored as a problem. Systematic water quality monitoring should require because drinking water may consist disease causing agents and toxic chemicals that is risk for human health. Thousands of chemical in high concentration have been identified in drinking water supplies around the world and are considered potentially hazardous to human health. In these chemicals heavy metals are the most harmful of the chemical pollution and are of particular concern due to their toxicities to humans [2]. There are 59 heavy metal in which there are five heavy metal, cadmium [Cd], chromium [Cr], copper [Cu], lead [Pb], and zinc [Zn], that considered to be highly toxic and hazardous heavy metal. They released by human activities into the environment and through natural constituents of the earth`s crust. Zinc is essential trace element found in virtually all food and potable water in the form of salts or organic complexes. Main sources of zinc in water are industrial discharge and natural sources because zinc is generally used in industrial purpose. Removal of zinc is important for water treatment process in purification of water. Morigaoleifera seeds contain a cationic coagulant protein that can be used either for drinking water clarification or wastewater treatment. It is generally found in tropic areas of India [3].

Through this paper we can solve the problem of water and can improve the quality of drinking water in rural areas.

Literature Review
Klaus-Dieter BLAKE, *et al*. says that water purification also

has been done with the help of 'Artificial Ground water recharge'. Artificial groundwater recharge is the infiltration of surface water into shallow aquifers to increase the quality of water stored in the subsurface and to improve the quality by processes of natural attenuation [10].

Anders Locke and Louise Ullmann, *et al*. says that water can be cleaned by sunlight. For proof their thought they designed a system for purifying water, is called 'Solarsack'.It is a special bag that is filled with four liters of water and placed in the sun for four hours. Using UVA and UVB rays, as well as heat from the sun, the water is cleaned of pathogenic bacteria. The method was approved by the World health Organization which estimates that about 99.99% of pathogenic bacteria is die in the water. We can reuse a bag about 150 times more [9].

Behrooz Eftekhar, *et al*. says that Fluoride is the natural element that generally be found in all sorts of water and helps to clean it. Using fluoride in tap water is generally used by many cities for 60 years, but cities those have no any technique to clean water they have natural supplements. From past-few-years we are using common process of water purification in which we includes UV irradiation and ion exchange systems. Then why we can't use the fluoride instead of heavy metal or other ion experiments? So after he get that is filtration significantly decreased the fluoride concentration even as much as in some cases.

EK Jacobsen, *et al*. says that water that we useful domestic agriculture and for drinking is being treated before using. We use many steps of filtration of water like screening, sedimentation, sedimentation with coagulant, filtration and disinfection. In disinfection we use activated carbon that absorbs all the impurities in it [5]. Using of these method students makes a water filtration column using a two-liter plastic bottle that contains layers of gravel, sand, and activated charcoal they contaminate a sample of water and examine the filtration ability of the column.

Method

First of all sample were carried out into bottles from different sources and put into refrigerator for further experiment. Second step is microbial limit test performed on water sample in which the R2A agar media was prepared with the help of micropipette, 1ml of each water sample is poured in the sterile Petri plates and them at about 318 k temperature of the R2A agar media poured in those Petri plates and rotated in clock and anti-clock wise direction [6]. After some time the media was solidified, then it will kept into the incubator at 308k for 5 days. Then regularly observation was taken and result was noted [7].

Preparation of plants has been done in which leaves and seeds were collected then after drying them fine powder was obtain with the help of grinder and then collected. These extract were applied in water sample. Some reaction was held in water.

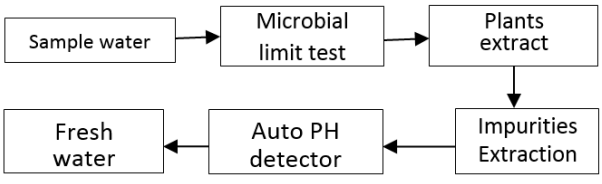

Fig 1: Block diagram for water purification

Optimization Result

The result is that we get water after the reaction it shows 90% of decrement of bacteria or health affected microorganism.

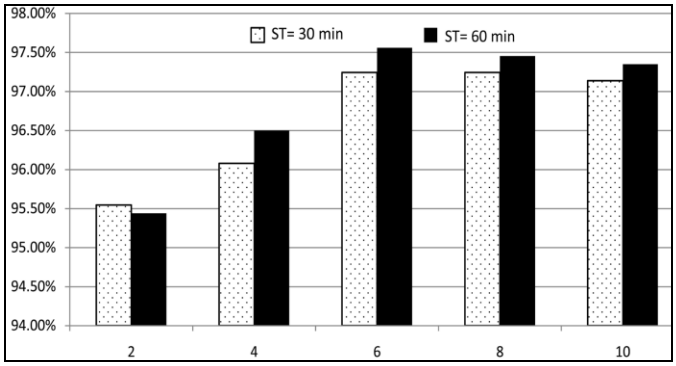

Fig 2: Optimized result of water purification

Percentage of Sludge form

Initial turbidity 10

Optimal dose of Aluminum sulfate (mg/l) 10

Optimal dose of sludge (mg/l) AS35

Dose of AS (mg/l) proposed to be used with optimal dose of sludge 6

Turbidity removal percentage using only AS (1) 96.71%

Turbidity removal percentage using AS and sludge as coagulant aid (1) + (2)97.14%

Turbidity removal percentage using optimal dose of sludge and AS (2) + (3) 97.56%

References

1. Adams BL, *et al*. Survival of Helicobacter pylori in a natural fresh-water environment. Applied and Environmental Microbiology. 2003; 69:7462-7466.
2. Adesunkanmi LV, Sridhar MKC, Ajayl AA, Oluwande PA, Olawuyi JF. An assessment of the health and socio economic implications of sachet water in Ibadan: A public health challenge. Afr. J Biomed. Res. 2004; 7:5-8.
3. Agarwal Ashok K, Rajwar Govind S. Physico-Chemical and Microbiological Study of Tehri Dam Reservoir, Garhwal Himalaya, India; Journal of American Science. 2010; 6(6):65-71.
4. Kumar A. Physico chemical analysis and isolation of bacteria from water sample of Maharana Pratap Sagar, kangra district Himachal Pradesh. Center for Watershed Protection Watershed Protection Techniques. Microbes and Urban Watersheds. 1999-2012; 1:551-596.
5. CIA- The world fact book, Central Intelligence Agency. Retrieved 2008-12-20. Eng strand L. Helicobacter in water and waterborne routes of transmission. Journal of Applied Microbiology. 2008; 90:80S-845.
6. Lewis DM. Application of phyto disinfectants in water purification. 2010; 5(6):628-635.
7. Fenwick A. Waterborne Infectious Diseases- Could they be consigned to Rthtory. Science. 2006; 313:1077-1081.
8. Ganoza CA, Matthias Collins-Richards D, Brouwer KC, Cunningham CB, Segura ER, Gilman RH, *et al*. Determining risk for severe leptospirosis by molecular analysis of environmental surface waters for pathogenic Leptospira. PL0S Med. 2006; 3:1329-1340.

9. Goodman KJ, *et al*. Helicobacterpylori infection in the Colombian Andes: a population-based study of transmission pathways. Arnerice Journal of Epidemiology. 1996; 144:290-299.
10. Gregory BM, Frick EA. Faecal coliform bacterial concentrations in Streams of the Chattahocheeriver National Recreation Area, Metropolitan Atlanta, Georgia, May-October 1994 and 1995. US geological Survey Report, 1995, 00-4139.
11. Gleick PH. ed. Water in Crisis: A Guide to the World's Freshwater Resources. Oxford University Press. Table 2.1 Water reserves on the earth, 1993, 13.
12. Harrison KG. (ed.). State of Michigan's Environment 2003-Second BielniaI Report, December 2003. Office of Special Environmental Projects: Lansing. Mich., Michigan Department of Environmental Quality, 2003, 84.