



Water Treatment Using Solar Energy

95. Ngokolo

Veronica Gwisu, Thomas Ngonyani and Emmanuel Christopher

Introduction:

Solar water disinfection, also known as **SODIS** is a method of disinfecting water using only sunlight and plastic PET bottles. SODIS is a free and effective method for decentralized water treatment, usually applied at the household level and is recommended by the World Health Organization as a viable method for household water treatment and safe storage. SODIS is already applied in numerous developing countries.



Methods:

Exposure to sunlight has been shown to deactivate diarrhea-causing organisms in polluted drinking water. Three effects of solar radiation are believed to contribute to the inactivation of pathogenic organisms:

UV-A interferes directly with the metabolism and destroys cell structures of bacteria.

UV-A (wavelength 320–400 nm) reacts with oxygen dissolved in the water and produces highly reactive forms of oxygen (oxygen free radicals and hydrogen peroxides) that are believed to also damage pathogens.

Cumulative solar energy (including the infrared radiation component) heats the water. If the water temperatures rises above 50 °C, the disinfection process is three times faster.

Materials/ Apparatus.

Plastic bottle covered with black color

Plastic container

Media (stones, gravel, sand).

Polluted water /impure water

Solar radiation

Photometer

Filter with sanction pump

Petri dish

Incubator



Results:



Plastic bottle containing filtered water were exposed to the sunlight for whole the day to kill the pathogens (bacteria) in water.



Photometer system was used to measure the turbidity of water which was 5TCU (true colour unity)



Water was poured into the filter with its membrane then sucked with the suction pump connected on the filter, the membrane filter was removed and put in the Petri dish which contain food to assist growth of bacteria.

Conclusions:

After twenty four (24) hours the Petri dish was removed in the incubator and no any bluish color seen which indicate the presence of thermal tolerance bacteria.

The hypothesis is true.

Acknowledgements:

We do thanks Mr. Joseph Pombe (BED science) and Mr. Methew Kaijunga for their effective assistance in fund and materialwise. Also Mr. Chereheni and Julius Bujiku (water laboratory officer) for assisting us in proving the safeness of water.

Further information:

Download at: www.youngscientists.co.tz/posters