

TITLE: DISINFECTION AND FILTRATION OF WATER BY NATURAL PROCESSES: EXPOSURE BY SOLAR RADIATION AND FILTRATION BY *Xanthosoma sagittifolium* Schott.

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ABSTRACT:

Good quality water is a universal and essential right to the health of the population, because when contaminated, the water becomes a vehicle for the transmission of various diseases. Tap water and stream nesting used in nature by the population undergoes a series of environmental impacts which influence the microbiological, physical and chemical quality of the water. The use of solar energy for water disinfection as well as being accessible to the populations of less-favored regions for its low cost, has the advantage of using disposable materials like bottles of polyethylene terephthalate (PET). This study aimed to evaluate the potability of this water, by analyzing the parameters pH, turbidity, apparent color, total coliforms and *Escherichia coli*, and propose low-cost disinfection methods. Three disinfection methods were used: the methodology proposed by *Solar Water Desinfection* project (SODIS) which consisted of water disinfection by solar radiation and temperature, the use of solar concentrator similar to that proposed by the IMTA - Mexican Institute of Water Technology, which uses boxes covered with aluminum foil in order to increase the temperature of the water and how innovative method using taro stem submerged in the water. The combination of these methods seeks to eliminate microorganisms that cause diseases such as cholera, dysentery, among others. Water samples for analysis were collected from the spout in which the population makes direct and indirect use of this water, and then it was applied the water treatment in Dandara settlement comprising 18 needy families, whose only source contaminated stream water. The microbiological results showed of 95% efficiency in the traditional disinfection process, 98% using the solar concentrator, and 85% with the stem of taro. The pH values were lower, but close, the minimum required by Ordinance No. 2914, but which do not cause health problems. On the other hand, parameters such as turbidity and apparent color were all within the

allowed by law. All in all, the methods proposed to sanitize the water obtained satisfactory values when compared to the initial situation of the water that is consumed by the population.

Keywords: Drinking water, low-cost disinfection processes, Innovation