



# Micro Plastics In Drinking Water

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### Introduction:

Certain institutions like UNESCO have announced the presence of microplastics in water especially surface water. These microplastics have a lot of effect in the human body and the environment. It has come to our attention that we think the same microplastics are in our drinking water. The microplastics in drinking water may result to dangerous effect to human body like kidney failure if consumed in large amount. Our project aims at finding out the presence of microplastics in drinking water. The media and certain institutions worldwide like WHO and UNESCO have been announcing about the presence of microplastics in our drinking water. Microplastics are small plastics are mostly polyethylene, which have come from different source like Industrial processes, clothing and other commonly used items like cosmetics, shampoos, toothpaste and soap. Because of this, in 2008, UNESCO did a project on microplastics and estimated that there is 240 tons (529200 lb.) of microplastics produced per year



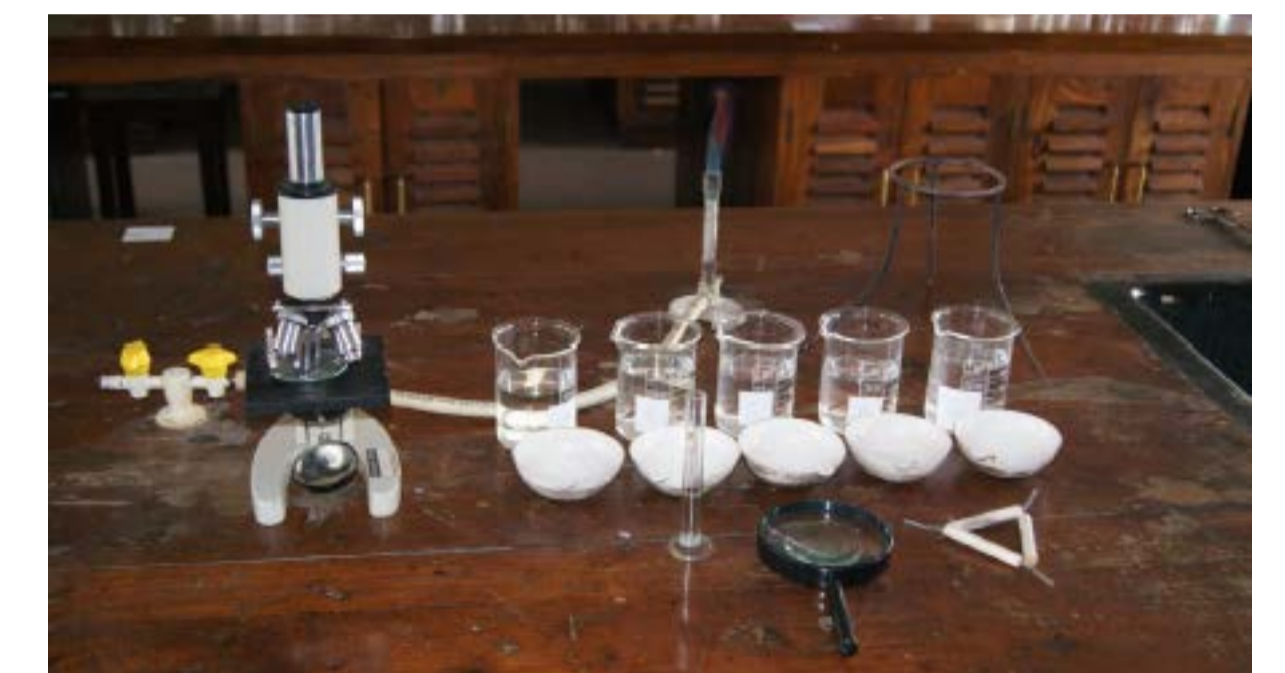
### Method:

We did experiment in our school laboratory on the different samples which we considered. We were trying to find out presence of microplastics for each sample and presented the results according to the level of microplastics content in the samples.

In this part, we have used the following materials; Simple microscope, Hand Lens, Evaporating dish, Bunsen burner, measuring cylinder (10ml), tripod stand and samples of water from different sources as they are shown :

We used the following procedure when doing the project

1. We measured about 5.0 ml from the experimented sample
2. We poured the sample into the evaporating dish
3. We then placed the evaporating dish with the sample on top of a tripod stand, and carefully moved the tripod stand on a lit Bunsen burner.
4. We waited for about 4 - 5 minutes till when all of the water had evaporated from the dish.
5. We carefully removed the evaporating dish from the tripod stand using tongs as it was hot
6. We finally viewed the evaporating dish using a hand lens and simple microscope to see if present or not



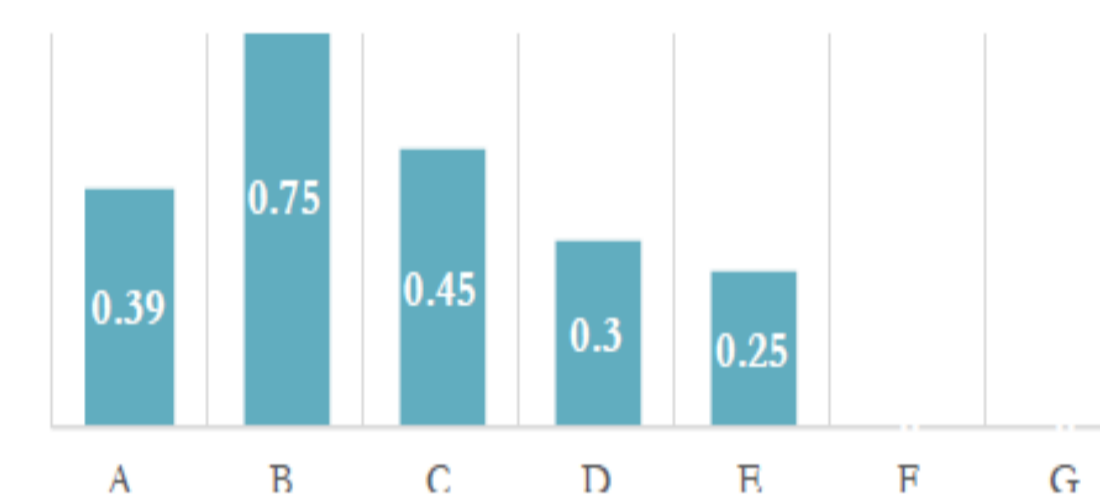
### Results:

Most of the samples' impurities left were microplastics seen in strands. The table below shows approximated value of the amount of microplastics in the tested samples . We also did another experiment when larger volumes of the samples were used,

TABLE 1: USING 5ML

SAMPLE	Sample from	Has microplastics?	Sample Size in volume (cm <sup>3</sup> )	Viewed amount (size)	Approximate Value
A	Loyola drinking water		5.0	medium	0.39
B	Well water		5.0	large	0.75
C	Tap water		5.0	medium	0.45
D	Uhai bottled water		5.0	small	0.30
E	Kilimanjaro water		5.0	Very small	0.25
F	Rain water		5.0	None Seen	0.00
G	Distilled water		5.0	None seen	0.00

DETERMINE SIZE BY APPROXIMATION



#### LEGEND:

- A - Loyola water B - Well water
- C - Tap water D - Uhai water
- E - Kilimanjaro water
- F - Rain water G - Distilled water

#### Approximated Range:

- 0.00 = None
- 0.05 - 0.25 = Very small
- 0.25 - 0.45 = small
- 0.45 - 0.55 = Medium
- 0.55 - 0.75 = Large
- 0.75 - 0.95 = Very large
- 1.00 = Very large amount (Sea like)

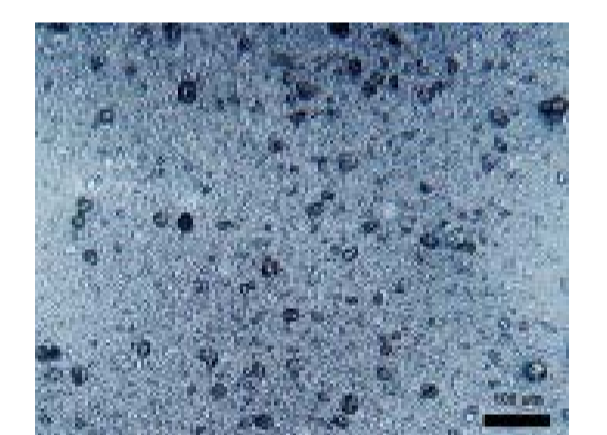


Fig1: Microplastics content from toothpaste when viewed from microscope (Pic ref. 1)

### Conclusions

According to our results we see that rain and distilled are the waters with few impurities distilled having none that we can see. We conclude by saying that the water suggested are very suitable for drinking since its few and no amount of microplastics make the body avoid possible harm and diseases like Liver cancer, throat cancer and kidney failure.

The data collected from the project are primary data. And the samples used are the water which are commonly consumed by people living in Dar-es-salaam. Our data is collected according to what we see and not according to what is calculated so the data might be different according to other peoples' perspective as well. Also on our data, we are not sure if the impurities we extracted are only microplastics. Some samples may possibly contain other impurities like salt which may cause a problem to our experimentation and results.

### Acknowledgments

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### NOTES REFERENCES:

1. UNEP, "Microplastics" pp 01, 2013. [http://www.unep.org/yearbook/2013/pdf/Microplastic\\_english.pdf](http://www.unep.org/yearbook/2013/pdf/Microplastic_english.pdf)
2. Morris and Chapman: "Marine Litter", "Green Facts: Facts on Health and the Environment", 2001-2015
3. Book of "International Campaign against microbeads in Cosmetics", 2015.
4. Article on "Accumulation of Microplastics on Shorelines worldwide: Sources and Sinks" - 2011.
5. <http://iciscenter.org/plastics-and-their-impacts-on-human-health/>
6. Grossman, Elizabeth: "How Microplastics from Your Fleece Could End up on Your Plate", "Civil Eats", January 15, 2015