

Bacteria in Filtered Water

Gillian Eshelman, Virginia Tam, Cosmo
Curbeam, Tristan Stinson





Introduction

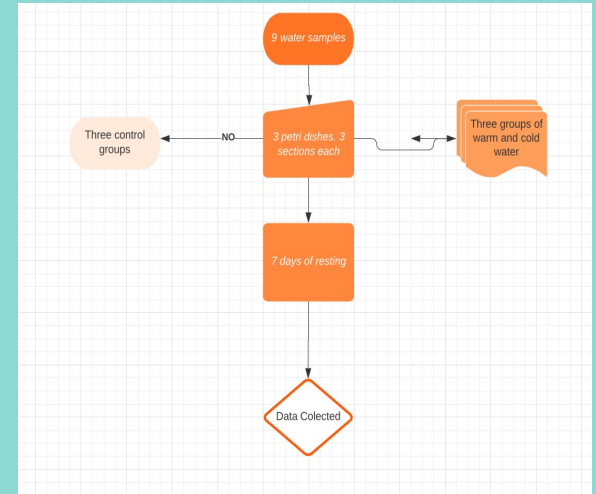
Background: It is important and necessary to understand the best environments to prevent the growth of bacteria for the sake of sterility and safety. Currently, with the world's focus towards a cleaner and more sanitised world, preventing bacterial growth and infections has become a number one global priority. Ultimately, drinking water is a number one contact concern regarding bacteria.

Objective: To find evidence regarding bacterial growth within the agar plates.

Hypothesis: The hot filtered water will have less bacteria and colonies within the plate than the room temperature and cold water. (Adamčík, 2002)

Methods

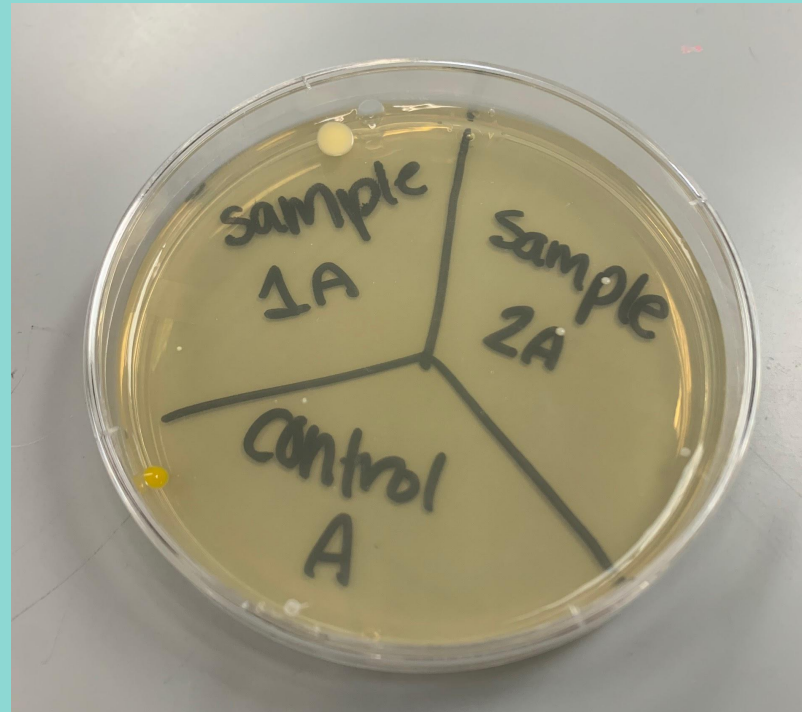
- Nine water samples were collected, three cold, three warm, three were room temperature (control)
- Samples obtained by inoculation loops
- Three separate petri dishes were used to gather data from the water samples (similar to Fujikawa and Matsushita, 1989).
- Each petri dish separated into three sections: one for cold, one for warm, and one control
- Samples spent one week in the cabinet at room temperature
- Data collected



Results: Agar Plate A

This plate contained the most amount of colonies

There were lots of tiny colonies that were hard to see



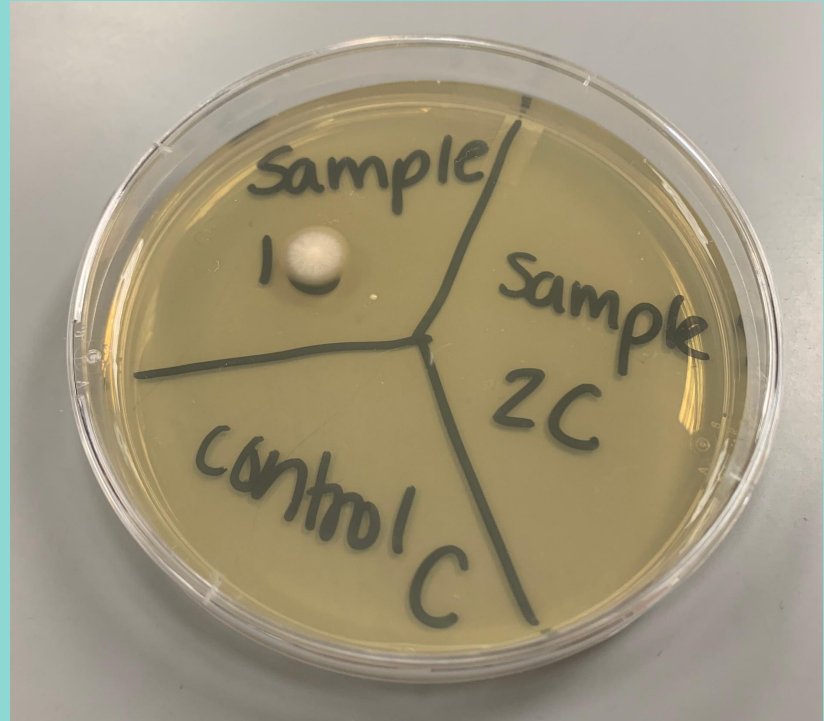
Results: Agar Plate B

This was the only plate that contained a red colony

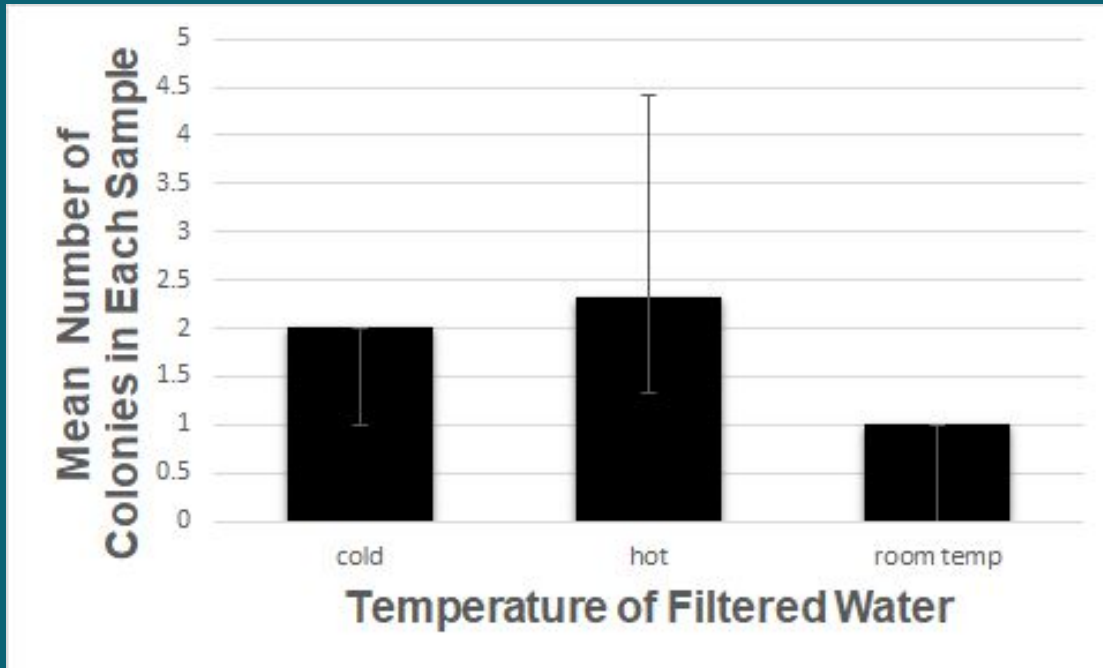


Results: Agar Plate C

If you look super close in control C, you can see a super tiny colony inside of the “C”



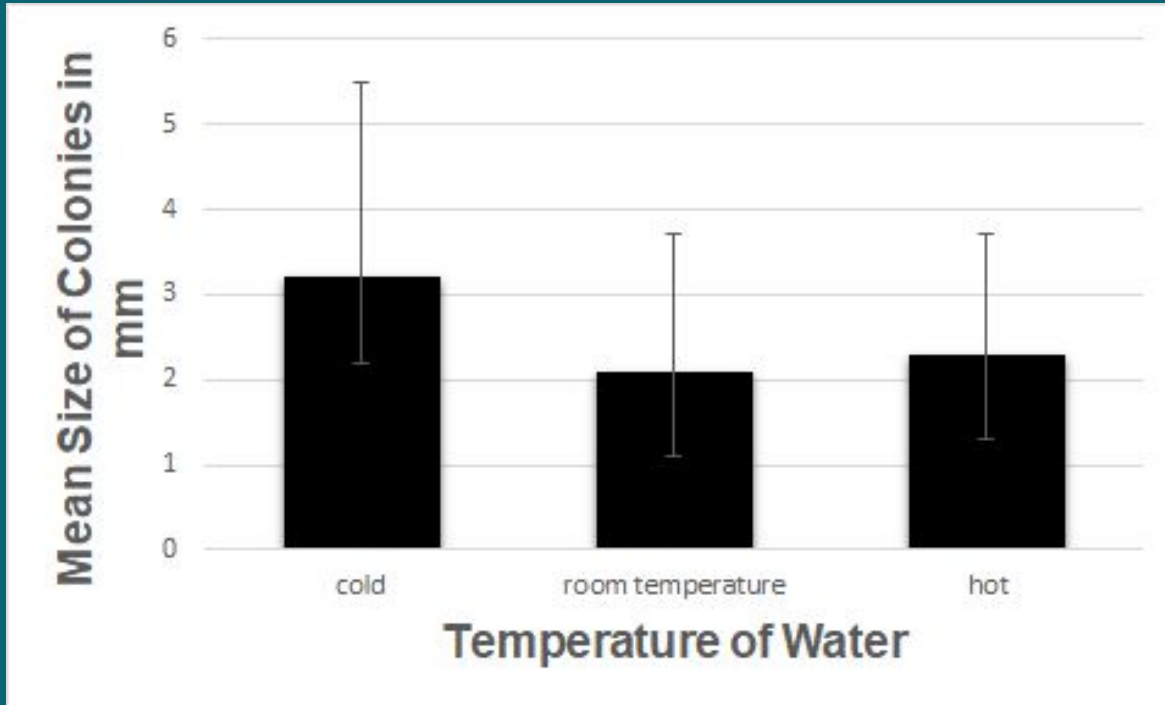
Quantitative Data - Number of Colonies



There were twice as many colonies in the hot and cold water than there were in the room temperature water.

Figure. 1. The mean number of bacterial colonies in each water sample

Quantitative Data - Size of Colonies



Cold water had the largest sized colonies

Figure. 2. The mean size of bacterial colonies in each water sample measured in millimeters

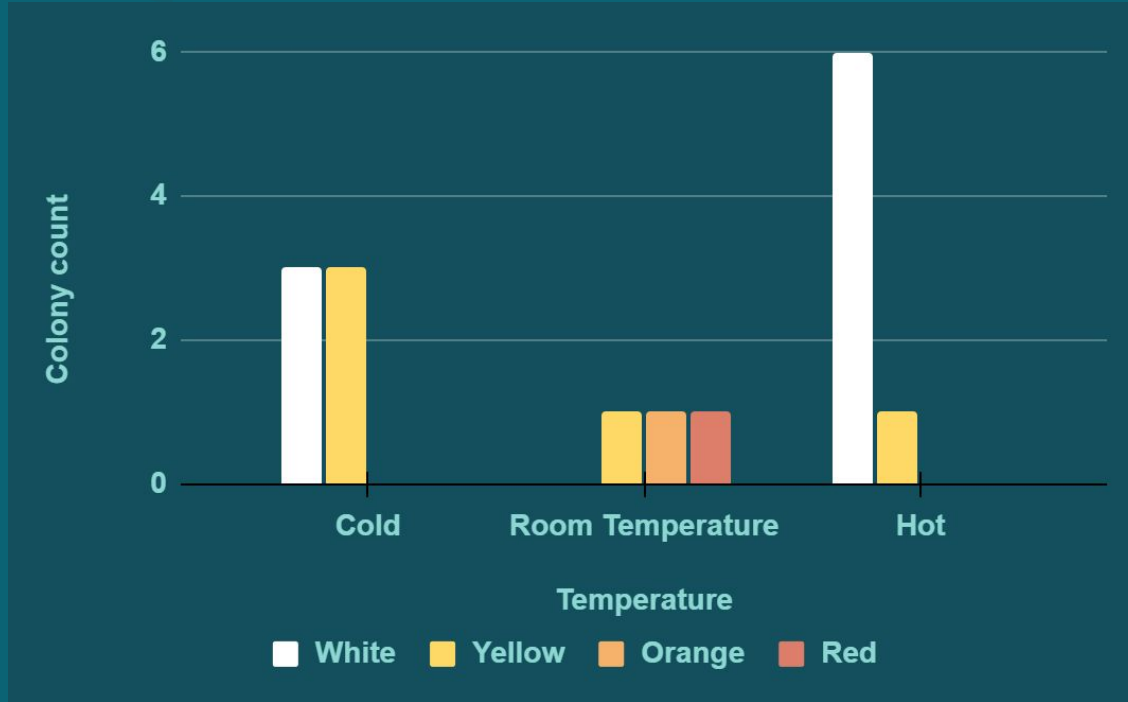
Qualitative Data - Color of Colonies Table

	White	Yellow	Orange	Red
Cold	3	3	0	0
Room Temperature	0	1	1	1
Hot	6	1	0	0

The room temperature filtered water was the only sample that had orange and red colonies.

Table. 1. The color of bacterial colonies in each water sample

Qualitative Data - Color Colonies Chart



This chart better shows how many white colonies were found in the hot water sample compared to the other two samples

Figure. 3. The color of bacterial colonies of each water sample



Conclusions...

Most prominently, the data displays that room temperature water contains the least overall instances of bacteria, which rejects our initial hypothesis.

The project was largely subjected to relatively unsterile environments, and methods were rather simple. Additionally, data may be flawed. (Allen, 2004) , (Rampelotto, 2013) , (Adamčík, 2002)

Ultimately, contact with bacteria is largely unavoidable, but it's not all bad. (Allen, 2004) ,

Works Cited

Allen, M. J., Edberg, S. C., & Reasoner, D. J. (2004). *Heterotrophic plate count bacteria—what is their significance in drinking water?* *International Journal of Food Microbiology*, 92(3), 265–274. doi:10.1016/j.ijfoodmicro.2003.08.017

Fujikawa, H., & Matsushita, M. (1989). *Fractal Growth of Bacillus subtilis on Agar Plates*. *Journal of the Physical Society of Japan*, 58(11), 3875–3878. doi:10.1143/jpsj.58.3875

Adamčík, J., Víglaský, V., Valle, F., Antalík, M., Podhradský, D., & Dietler, G. (2002). ELECTROPHORESIS, 23(19), 3300–3309.
doi:10.1002/1522-2683(200210)23:19<3300::aid-elps3300>3.0.co;2-q

Rampelotto, P. (2013). *Extremophiles and Extreme Environments*. *Life*, 3(3), 482–485.
doi:10.3390/life3030482