

Rotifer Density in Hornsby Shire Water Sources

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Hypothesis

Water sources near urban populations would be polluted from sources such as sewage, pesticides, herbicides, fertilizer, and car pollution including oil and asbestos. These pollutants would negatively impact rotifer density. Rotifers would still be present, however, at a reduced quantity.

WHAT IS A ROTIFER?

A rotifer is a type of microscopic animal that is an invertebrate. It is estimated that there are a total of 2,000 species of them. Even in recent years, there is not much anyone knows about them; however, it is believed that they could be related to an arrow worm (spadella cephaloptera) and this was discovered in 2018. It has been extremely hard to discover their evolution as their soft bodies turn into bad quality fossils. There has only been one rotifer fossil ever found outside of the Holocene. This sample was fossilized in amber from approximately thirty-five million years ago which was in the Eocene. This sample was also identical to rotifers that are still present. Rotifers are commonly found in freshwater ecosystems everywhere. Rotifers are also eutelic which means they will constantly have the same number of cells over their lifespan. They have approximately 1,000 cells. As a rotifer grows, its cells cannot divide which means they increase in size. Some rotifers form colonies from two to over one thousand. When in a colony, rotifers do not divide resources which has led to theories on what the colony is used for. When the water they are in, dries out, many of them go into anhydrobiosis where they remove all the water inside them and become a small structure that is about 30%-40% of their original weight. When they reach water, they re-absorb water and return to their original state. While this process happens, they do not age.

IMAGE OF A ROTIFER ANCHORED ON ALGAE EATING:



AIM

Measure rotifer density in Hornsby Shire water sources and infer about the general level of pollution.

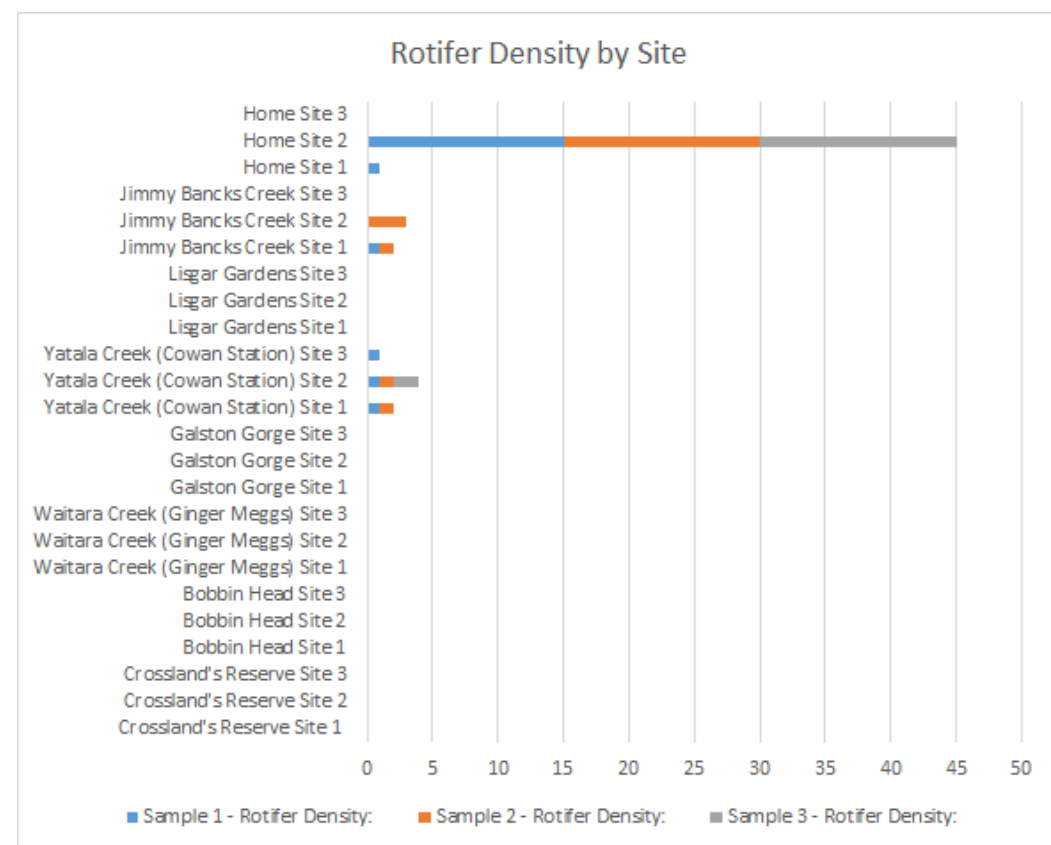
METHOD

The experiment was conducted by travelling to eight key locations. At each location, three sites were selected and at each of those sites, three samples were collected. After the samples were collected, the number of rotifers were counted using a Biological Microscope. Note that one of the eight locations was a control variable.

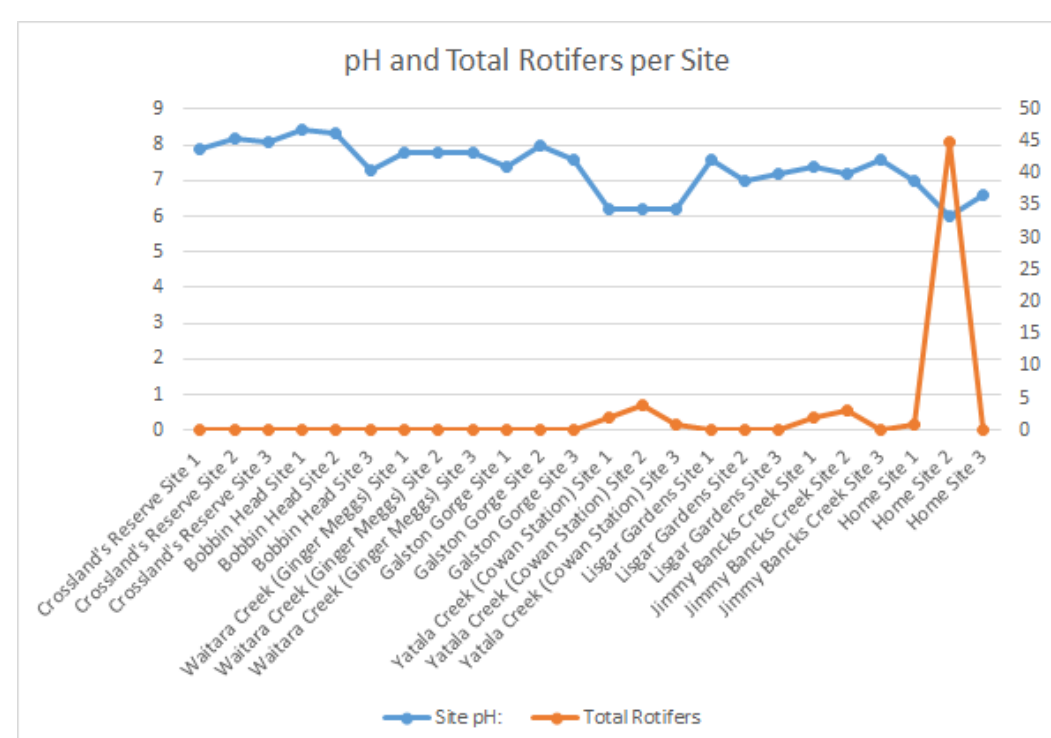
RESULTS

The hypothesis was correct, however, the amount of rotifers present were much less than originally expected. The results were mainly filmed, please go to <https://www.youtube.com/channel/UCIGamI7QWgfbhnuGK6TizTg/playlists> to watch them. Note that as the videos are public, numbers are used to refer to the locations. Crossland's Reserve is location 1 while home is location 8.

ROTIFER DENSITY BY SITE



POWER OF HYDROGEN IN RELATION TO TOTAL ROTIFERS PER SITE



DESCUSION

As a result of rapid reproduction and death, rotifers are impacted by changes in the water quality. Due to this, they can be used to estimate the general level of pollution and can also indicate a trend in water quality. It can be concluded that the water is extremely polluted and this along with the bacteria is resulting in the death of rotifers. This is further proved as the small pond outside that was site 2 for home was abundant in all life and surprisingly low in bacteria. There are thousands of protozoa in the samples and many protozoa that are unique in comparison to the rivers and creeks.

CONCLUSION

The results appear to indicate that the presence of urban pollution negatively impacts rotifer density. Most locations showed little to no rotifer presence and or other protozoa. However, in all of the rivers tested, bacteria was prolific. It is possible to speculate that the absence of rotifers and other protozoa is due to high bacterial populations. It appears the overwhelming quantity of bacteria destroyed all protozoa.

RELATED LITERATURE

The main source of information and also inspiration was from another YouTube Channel known as Journey to the Microcosmos, <https://www.youtube.com/channel/UCBbnbBWJtwsfOJLGuwX5Q3g>

Note that all videos and pictures published with this experiment are owned by Eli Guttman. The YouTube Channel, Journey to the Microcosmos was only used for information and inspired the idea of the experiment.