

## **The Cytotoxicity and Genotoxicity Assessment of Water Samples from Tasik Shah Alam using Allium Test**

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### **Structured Abstract**

**Background:** The root tips of *Allium cepa* (onion) was used to study cellular divisions due to its rapid growth and clear visibility of its chromosomes during mitosis. Lakes are well-known for many benefits to the ecosystem and humans. Its benefits ranges from providing sources of food and water to flood control. Pollution of the lake can negatively affect the ecosystem, particularly the flora and fauna. Due to the lack of public records and studies made in Tasik Shah Alam, it is difficult to determine whether the water quality of the lake is safe for the ecosystem and humans living near it. Determining the water quality of Tasik Shah Alam is important as that can inform the public about the water quality of Tasik Shah Alam. This study aims to assess the cytotoxicity and genotoxicity of water samples taken from Tasik Shah Alam using the Allium test.

**Methods:** The onion root tips were treated with water samples from different locations of Tasik Shah Alam. The growth rate for each length of time was calculated using the difference in length between initial and final length of root tips. The mitotic index was determined by calculating the percentage of cells that undergo mitosis. Chromosomal aberrations were obtained by observing each cell division that have aberrations and compare it with previous studies.

**Results:** Results indicate that water samples from Tasik Shah Alam does not have cytotoxic and genotoxic effects on the cells. The growth rates of onion root tips were increased as time of exposure to treatments increased, but no significant difference was found. This indicates that exposure to the water samples do not affect the growth rate of *Allium cepa*. The mitotic index means, and the Tukey post hoc test showed significant difference at 24 and 48 hours. Only one chromosomal aberration was observed, which is a chromosome bridging during anaphase.

**Conclusion:** The study concludes that water samples from Tasik Shah Alam can stimulate cell division but not induce genetic damage, indicating that there are nutrients in the water that affect the growth.

**Keywords:** Tasik Shah Alam, *Allium cepa*, Growth rate, Mitotic index, Chromosomal aberrations

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