

The study of copper oxide nanoparticle effects on growth of plant

Siti Nur Fasiha Muhamad Azudin & Lyena Watty Zuraine Ahmad

Structured Abstract

Background: The green synthesised nanoparticle is an alternative option for agriculture to combat plant diseases. The copper oxide nanoparticles (CuONPs) extracted from oyster mushrooms (*Pleurotus ostreatus*) are one of the potentially green-based nanoparticles that can be used to counter paddy plant disease. This study aimed to examine the effects of green-based copper oxide (CuO) nanoparticles on the morphology of plants by using paddy (*Oryza sativa*) as a plant bioassay.

Methods: Paddy seeds were exposed to copper oxide nanoparticles extracted from solutions of copper(II) sulphate and oyster mushroom extract with various concentrations (11020, 11030, 11050, 21030, 21050) for 24 and 48 hours. Then, the distilled water was used as a control solution. The macroscopic observations were conducted to observe the plant growth, including germination and survival percentage. The germinated seeds and survival seeds were recorded.

Results: Overall, the paddy seeds exposed to CuO nanoparticle solutions did not thrive compared to those under the control treatment. The germination percentage of paddy seeds for all solutions (0, 11020, 1030, 11050, 21030, 21050) under 24 and 48 hours of exposure was recorded at 100%. However, after 11 days of germination, the paddy seeds exposed to CuONP solutions did not thrive compared to those under the control treatment, where only seeds under control treatment survived 100% while the seeds under copper oxide treatments did not survive (0%). It can be deduced that the copper oxide nanoparticles impacted the survival of the paddy seeds because of the high concentrations of nanoparticles solutions.

Conclusion: In conclusion, the CuO nanoparticle can affect plant growth. It is suggested to reduce the concentration of copper oxide nanoparticles. So, it is more suited for future use in agriculture.

Keywords: *Allium cepa*, *Oryza sativa*, copper oxide, nanoparticles, mitotic cells

*Correspondence: 2020602768@student.uitm.edu.my

Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia