

## ABSTRACT

Addylla, T. C. 2025. **Study of the Ability of *Centella asiatica* in Phytoremediation of Ammonia Waste from Urea Fertilizer Factories in West Java.** Department of Biology, Faculty of Science and Mathematics, Diponegoro University. Supervised by Riche Hariyati dan Jafron Wasiq Hidayat.

The urea fertilizer industry produces liquid ammonia waste, which can be harmful to the environment at high concentrations. Therefore, phytoremediation using *Centella asiatica* plants can be used to reduce ammonia waste levels. This study aims to analyze the ability of *Centella asiatica* plants to reduce ammonia, COD, TSS, and pH values through phytoremediation and to determine the optimal parameters that can be achieved by these plants. The plants were acclimatized and then exposed to four variations of ammonia waste concentrations (0 mg/L, 15 mg/L, 30 mg/L, 45 mg/L) for 21 days. The measured parameters were tested using ANOVA, Kruskal-Wallis, Duncan, and Mann-Whitney tests. Based on the statistical test results, the concentration of ammonia waste and exposure time had a significant impact on ammonia levels, TSS, and plant biomass ( $P < 0.05$ ). *Centella asiatica* plants were able to reduce ammonia levels by 86.9% (from 45 mg/L to 5.90 mg/L), TSS from 39.50 mg/L to 26.00 mg/L, pH from 9.40 to 7.33, and maintained COD levels stable, with an increase from 45.33 mg/L to 49.60 mg/L, but still below the environmental quality standard limit of 100 mg/L. The most optimal parameter reduction achievable by *Centella asiatica* plants is at a concentration of 15 mg/L, where ammonia, COD, TSS, and pH levels have reached optimal and safe results according to environmental quality standards by day 7. Additionally, *Centella asiatica* was able to survive at a concentration of 15 mg/L until day 21.

*Keywords: NH<sub>3</sub>, pH, COD, TSS*