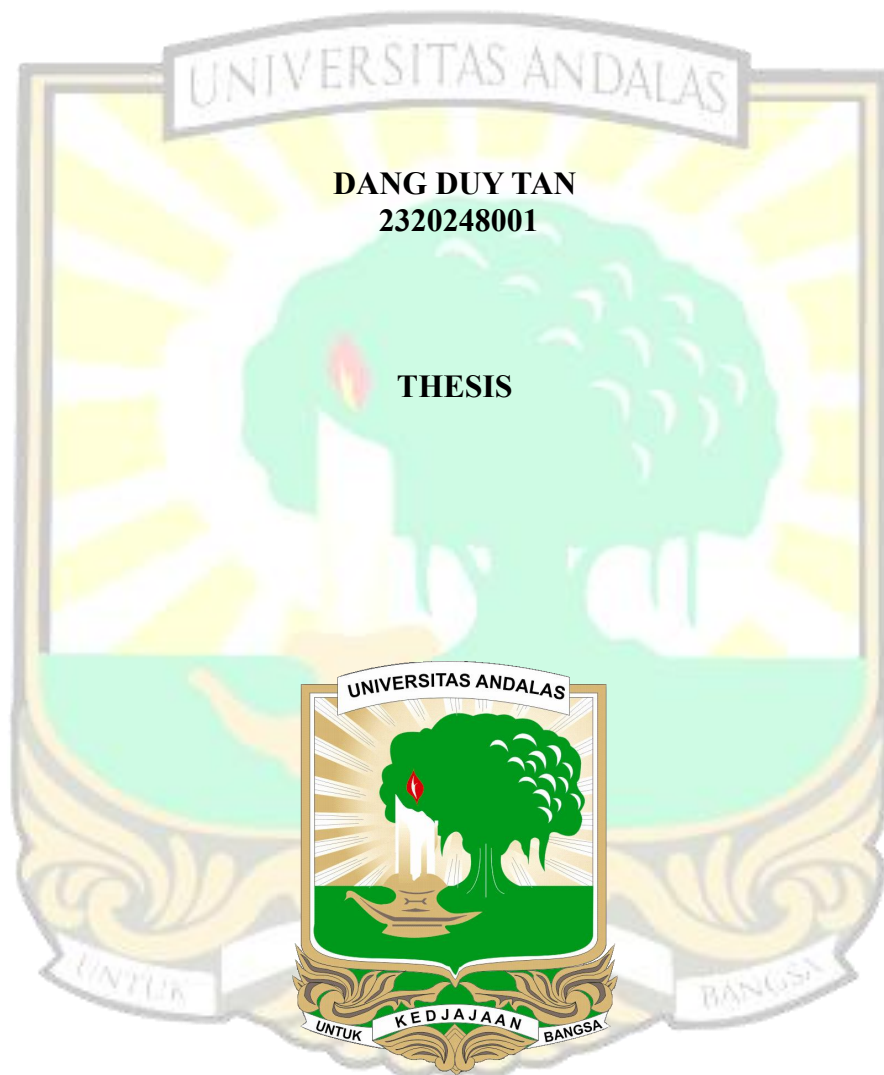


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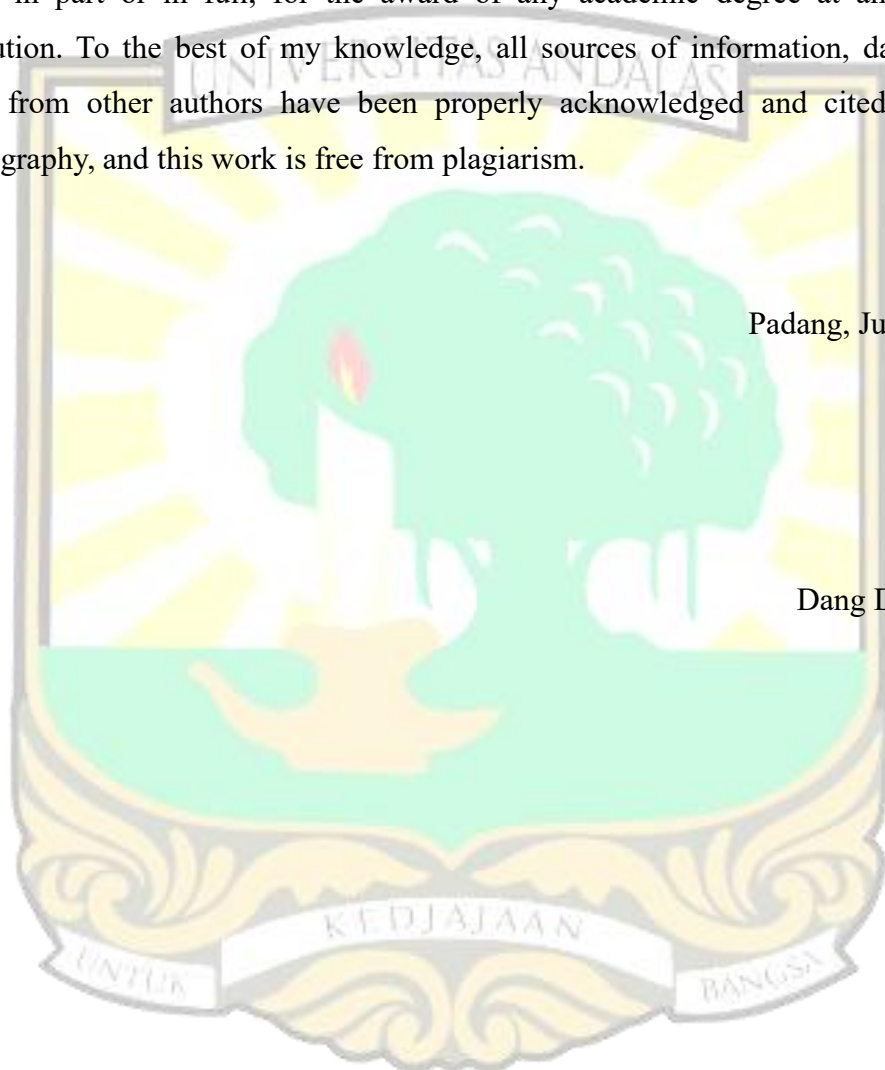
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DECLARATION OF ORIGINALITY

I, Dang Duy Tan (NIM: 2320248001), hereby declare that this thesis is my original work and was completed under the supervision of Prof. Ir. Irawati Chaniago, M.Rur.Sc., Ph.D. (Principal supervisor) and Dr. Aprizal Zainal, S.P., M.Si. (Co-supervisor). I further declare that this thesis has not been submitted, either in part or in full, for the award of any academic degree at any other institution. To the best of my knowledge, all sources of information, data, and ideas from other authors have been properly acknowledged and cited in the bibliography, and this work is free from plagiarism.

Padang, July 2025

Dang Duy Tan



SUMMARY

This study aims to analyze the allelopathic potential of three common weed species: *Eleusine indica*, *Kyllinga brevifolia* and *Sphagneticola trilobata* on the germination and growth of lettuce (*Lactuca sativa*), a known bioindicator species for phytotoxicity. The experiment was conducted from February to June 2025, using two bioassay approaches: the sandwich method in laboratory and pot experiment in greenhouse with different concentrations of weed litter (0%, 1%, 2%, 3%, and 4% (w/v for sandwich method and w/w for pot experiment)).

Results from the germination tests showed that all three weed species significantly reduced the germination percentage of *L. sativa* in a concentration-dependent manner, with the most severe inhibition under observed *S. trilobata* treatment. Similarly, seedling development measured through hypocotyl and radicle elongation was progressively suppressed by increasing litter levels. Among the three, *S. trilobata* showed the strongest allelopathic effect, followed by *K. brevifolia*, while *E. indica* showed a more variable response, with certain growth parameters showing mild stimulation at specific concentrations.

In pot experiment, the growth of *L. sativa* seedlings (shoot/root length and biomass) was significantly inhibited by both *K. brevifolia* and *S. trilobata*, supporting the hypothesis that their phytotoxic effects are mediated by allelochemicals. Conversely, *E. indica* showed a complex response: while root length was suppressed, shoot and root biomass increased slightly at moderate concentrations, likely due to slow decomposition and indirect soil modifications.