

PENGARUH *Indigofera zollingeriana* TERHADAP KELIMPAHAN BAKTERI AMONIFIKASI DAN KADAR AMONIUM TANAH PADA PERTANAMAN AGROFORESTRI DI DESA PITU, NGAWI

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INTISARI

Kesuburan tanah dipengaruhi oleh ketersediaan nitrogen yang dapat ditingkatkan melalui fiksasi nitrogen dan dekomposisi seresah tanaman seperti *Indigofera zollingeriana*. Meskipun tanaman ini dikenal memiliki biomassa besar dan berpotensi meningkatkan nitrogen tanah, pengaruhnya terhadap kelimpahan bakteri amonifikasi dan kadar amonium masih belum banyak diteliti. Penelitian ini bertujuan mengkaji peran *I. zollingeriana* dan kedalaman tanah terhadap kelimpahan bakteri amonifikasi serta kadar amonium tanah untuk mengetahui kontribusi tanaman ini terhadap kesuburan tanah.

Penelitian dilakukan pada bulan November 2024 s.d Maret 2025. Sampel tanah diambil pada dua jenis lahan yaitu lahan yang ditanami oleh *I. zollingeriana* dan tanpa *I. zollingeriana* pada kedalaman 0 – 10 cm, 10 – 20 cm, dan 20 – 30 cm di Desa Pitu, Kabupaten Ngawi, Jawa Timur. Parameter yang diukur pada penelitian ini adalah kelimpahan bakteri amonifikasi (sel/gram tanah) dan kadar amonium tanah (mg/kg) kemudian hasil pengukuran dianalisis menggunakan Uji T untuk mengetahui perbedaan dari rata-rata kedua parameter. Pengujian parameter dilakukan di Laboratorium Fisiologi Pohon dan Tanah Hutan, Fakultas Kehutanan, Universitas Gadjah Mada.

Berdasarkan hasil penelitian plot yang ditanami *I. zollingeriana*, menunjukkan kelimpahan bakteri amonifikasi sebesar $10,69 \times 10^6$ sel/gram tanah. Sedangkan pada plot tanpa *I. zollingeriana* berkisar antara $17,38 \times 10^6$ sel/gram tanah. Sebaliknya, kadar amonium pada kedua plot menunjukkan perbedaan yang signifikan. Plot tanpa tanaman *I. zollingeriana* memiliki kadar amonium yang lebih tinggi, yaitu 62,58 mg/kg, sedangkan pada plot yang ditanami *I. zollingeriana* yaitu 49,14 mg/kg. Kelimpahan bakteri amonifikasi dan kadar amonium tidak berbeda secara signifikan pada ketiga kedalaman tanah dan terdapat pola yang berbeda pada masing-masing plot di lokasi penelitian.

Kata Kunci: Bakteri amonifikasi, kadar amonium, *Indigofera zollingeriana*.

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THE EFFECT OF *Indigofera zollingeriana* ON THE ABUNDANCE OF AMMONIFICATION BACTERIA AND SOIL AMMONIUM CONTENT IN AN AGROFORESTRY SYSTEM IN PITU VILLAGE, NGAWI

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ABSTRACT

Soil fertility is influenced by nitrogen availability, which can be enhanced through nitrogen fixation and the decomposition of plant litter such as *Indigofera zollingeriana*. Although this plant is known to have high biomass and the potential to increase soil nitrogen, its effects on the abundance of ammonification bacteria and soil ammonium content have not been widely studied. This study aimed to examine the role of *I. zollingeriana* and soil depth on the abundance of ammonification bacteria and soil ammonium content in order to determine the contribution of this plant to soil fertility.

The study was conducted from November 2024 to March 2025. Soil samples were collected from two types of land: land planted with *I. zollingeriana* and land without *I. zollingeriana*, at depths of 0–10 cm, 10–20 cm, and 20–30 cm in Pitu Village, Ngawi Regency, East Java. The parameters measured in this study were the abundance of ammonification bacteria (cells per gram of soil) and soil ammonium content (mg/kg). The measurement results were analyzed using a t-test to determine differences in the mean values of both parameters. Laboratory analyses were conducted at the Tree Physiology and Forest Soil Laboratory, Faculty of Forestry, Universitas Gadjah Mada.

The results showed that the plot planted with *I. zollingeriana* had an abundance of ammonification bacteria of 10.69×10^6 cells per gram of soil, whereas the plot without *I. zollingeriana* had an abundance of 17.38×10^6 cells per gram of soil. In contrast, soil ammonium content differed significantly between the two plots. The plot without *I. zollingeriana* had a higher ammonium content (62.58 mg/kg) compared to the plot planted with *I. zollingeriana* (49.14 mg/kg). The abundance of ammonification bacteria and soil ammonium content did not differ significantly among the three soil depths, and different distribution patterns were observed between the two plots at the study site.

Keywords: *Indigofera zollingeriana*, ammonification bacteria, soil ammonium content

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