Kelimpahan Bakteri Amonifikasi dan Kadar Amonium di Lahan Revegetasi Pascatambang Batu Bara PT Kadya
Caraka Mulia Provinsi Kalimantan Selatan Â
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KELIMPAHAN BAKTERI AMONIFIKASI DAN KADAR AMONIUM DI LAHAN REVEGETASI PASCATAMBANG BATU BARA PT KADYA CARAKA MULIA PROVINSI KALIMANTAN SELATAN

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INTISARI

Pertambangan batu bara dengan sistem *open pit* menyebabkan kerusakan fisik tanah dan penurunan populasi mikroba, sehingga siklus hara menjadi terganggu. Upaya pemulihan lahan tersebut dapat dilakukan melalui revegetasi menggunakan tanaman pionir legum. Penanaman vegetasi pionir ini mampu meningkatkan kandungan bahan organik tanah yang berfungsi sebagai substrat bagi mikroorganisme. Salah satu mikroorganisme tanah yang krusial adalah bakteri amonifikasi yang berperan mengonversi nitrogen organik menjadi amonium (NH_4^+) yang siap diserap tanaman. Penelitian ini bertujuan untuk menganalisis kelimpahan bakteri amonifikasi dan variasi kadar amonium tanah pada lahan revegetasi bekas tambang batu bara yang ditanami berbagai jenis tanaman pionir.

Penelitian ini dilaksanakan pada Februari hingga Juni 2026 dengan menggunakan rancangan *purposive sampling.* Sampel tanah diambil dari dua jenis tanaman pionir dan lahan kontrol tanpa vegetasi pada dua lapisan tanah yang dibedakan berdasarkan warna. Pengambilan sampel tanah dilakukan di lahan revegetasi PT Kadya Caraka Mulia dan pengujian sampel tanah dilakukan di Laboratorium Fisiologi dan Tanah Hutan, Fakultas Kehutanan, Universitas Gadjah Mada.

Hasil penelitian menunjukan bahwa populasi bakteri amoifikasi tertinggi di bawah tegakan trembesi sebesar 3,9 x 10^8 sel/gram (7,44 Log sel/gram), diikuti tegakan sengon sebesar 8,2 x 10^7 sel/gram (7,20 Log sel/gram), dan lahan kontrol sebesar 1,1 x 10^5 sel/gram (5,01 Log sel/gram). Populasi bakteri amonifikasi menurun seiring bertambahnya kedalaman tanah. Kadar amonium tertinggi di bawah tegakan trembesi sebesar 68,52 mg/kg, diikuti tegakan sengon sebesar 64,28 mg/kg, dan lahan kontrol sebesar 16,5 mg/kg. Kadar amonium menurun seiring bertambahnya kedalaman tanah.

Kata Kunci: Bakteri Amonifikasi, Amonium, Revegetasi, Tegakan Pionir

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ABUNDANCE OF AMMONIFYING BACTERIA AND AMMONIUM LEVELS IN THE COAL POST MINING REVEGETATION OF PT KADYA CARAKA MULIA, SOUTH KALIMANTAN PROVINCE

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ABSTRACT

Open-pit coal mining causes soil physical damage and depletes microbial populations, thereby disrupting nutrient cycling. Land rehabilitation efforts can be achieved through revegetation using pioneer legumes. The planting of these pioneer species increases soil organic matter content, which serves as a vital substrate for microorganisms. One crucial soil microorganism is ammonifying bacteria, which play a key role in converting organic nitrogen into plant-available ammonium (NH4+). This study aims to analyze the abundance of ammonifying bacteria and the variation of soil ammonium levels in a reclaimed coal mine land planted with various pioneer species.

The study was conducted from February to June 2026 using a purposive sampling design. Soil samples were collected from beneath two pioneer species and an unvegetated control plot across two soil layers distinguished by color. Soil sampling was performed at the revegetation area of PT Kadya Caraka Mulia, and sample analysis was carried out at the Forest Physiology and Soil Laboratory, Faculty of Forestry, Universitas Gadjah Mada.

The results showed the highest population of ammonifying bacteria was found under trembesi at 3,9 x 10^8 cells/gram (7,44 Log cells/gram), followed by sengon at 8,2 x 10^7 cells/gram (7,20 Log cells/gram), and the control plot at 1,1 x 10^5 cells/gram (5,01 Log cells/gram). The population of ammonifying bacteria decreased with soil depth. Similarly, the highest ammonium content was recorded under trembesi at 68.52 mg/kg, followed by sengon at 64.28 mg/kg, and the control plot at 16.5 mg/kg. Soil ammonium content also decreased significantly with depth.

Keywords: Ammonifying Bacteria, Ammonium, Revegetation, Pioneer Vegetation

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