

ABSTRAK

POTENSI *PHYTOMINING* NIKEL (Ni) OLEH TUMBUHAN HERBA ADAPTIF DI SEKITAR LAHAN TAMBANG BLOK TIRTA, PT. SULEMANDARA KONAWE, PROVINSI SULAWESI TENGGARA

Oleh
Dhea Adalati Az-Zahra
NIM: 114210001
(Program Studi Sarjana Teknik Lingkungan)

Peningkatan aktivitas eksploitasi nikel menyebabkan terbentuknya lahan terbuka yang jika tidak dikelola akan berisiko menimbulkan dampak lingkungan seperti erosi dan pelindian serta menyebabkan penurunan kualitas tanah sehingga tumbuhan sulit berkembang. Lahan terbuka yang memiliki kadar nikel rendah berpotensi dimanfaatkan melalui *phytomining* dengan menggunakan tumbuhan yang telah beradaptasi pada lingkungan di sekitarnya. Tujuan penelitian ini adalah untuk mendeskripsikan karakteristik tanah berdasarkan sifat kimia (pH, KTK, kadar Ni) dan sifat fisik (tekstur tanah) pada Blok Tirta PT. Sulemandara Konawe, menganalisis keragaman tumbuhan herba adaptif pada Blok Tirta PT. Sulemandara Konawe, menganalisis nilai *Bioconcentration Factor* (BCF) dan faktor yang memengaruhinya, serta menganalisis potensi *phytomining* nikel (Ni) oleh tumbuhan herba adaptif di sekitar lahan tambang PT. Sulemandara Konawe berdasarkan nilai *Bioconcentration Factor* (BCF) dan bioakumulasi.

Metode pengambilan data bervariasi pada tiap parameternya. Karakteristik tanah melalui pengambilan sampel tanah komposit dengan parameter pH, KTK, tekstur, dan kadar Ni tanah. Analisis keragaman menggunakan metode analisis vegetasi dengan parameter frekuensi, kerapatan, indeks nilai penting, serta indeks keanekaragaman. Potensi *phytomining* diperoleh berdasarkan perbandingan kadar nikel pada tanah dan tumbuhan (BCF) dan bioakumulasi. Pengujian kadar Ni dilakukan dengan menggunakan metode AAS.

Karakteristik tanah Blok Tirta yaitu pH 7,02 – 7,25 (netral), nilai KTK 13,26 cmol/Kg – 40,37 cmol/Kg (rendah – sangat tinggi), kadar Ni tanah 58,7297 ppm – 75,0986 ppm, dan tekstur didominasi oleh tekstur lempung berliat. Terdapat 9 spesies tumbuhan herba adaptif dan indeks keanekaragaman daerah penelitian tergolong rendah (0,8). Nilai *Bioconcentration Factor* tumbuhan berkisar antara 0,02 – 0,28. Potensi *phytomining* tumbuhan herba yang diuji adalah rendah – sedang. Potensi *phytomining* dapat ditingkatkan dengan menggunakan bahan pengkhelat dan mikoriza.

Kata kunci: nikel, *phytomining*, tumbuhan herba

ABSTRACT

PHYTOMINING POTENTIAL OF NICKEL (Ni) BY ADAPTIVE HERBAL GROWTHS NEAR THE TIRTA BLOCK MINING LAND, PT. SULEMANDARA KONAWE, SOUTHEAST SULAWESI PROVINCE

By

Dhea Adalati Az-Zahra

NIM: 114210001

(Environmental Engineering Undergraduated Program)

The increase in nickel exploitation activities has led to the formation of open land, which if not managed will risk environmental impacts such as erosion and leaching and cause a decrease in soil quality making it difficult for plants to thrive. Open land that has low nickel levels has the potential to be utilized through phytomining using plants that have adapted to the surrounding environment. The purpose of this study was to describe soil characteristics based on chemical properties (pH, CEC, Ni content) and physical properties (soil texture) in Tirta Block of PT Sulemandara Konawe, analyze the diversity of adaptive herbaceous plants in Tirta Block of PT Sulemandara Konawe, analyze the Bioconcentration Factor (BCF) value and the factors that influence it, and analyze the potential of nickel (Ni) phytomining by adaptive herbaceous plants around PT Sulemandara Konawe mine land based on Bioconcentration Factor (BCF) value and bioaccumulation.

Data collection methods varied for each parameter. Soil characteristics through composite soil sampling with parameters of pH, CEC, texture, and soil Ni content. Diversity analysis using survey and mapping methods with frequency, density, importance index, and diversity index parameters. The phytomining potential was obtained based on the comparison of nickel levels in soil and plants (BCF) and bioaccumulation. Ni content testing was carried out using the AAS method. Data analysis was carried out by statistical analysis of Pearson correlation test and multiple linear regression analysis.

The soil characteristics of Tirta Block are pH 7.02 - 7.25 (neutral), CEC value 13.26 cmol/Kg - 40.37 cmol/Kg (low - very high), soil Ni content 58.7297 ppm - 75.0986 ppm, and texture dominated by clayey loam texture. There were 9 species of adaptive herbaceous plants and the diversity index of the study area was low (0.8). The Bioconcentration Factor values of the plants ranged from 0.02 - 0.28. The phytomining potential of the tested herbaceous plants was low - medium. Phytomining potential can be enhanced by the use of chelating agents and mycorrhiza.

Keywords: herbaceous plant, nickel, phytomining