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**Pengaruh Penambahan Abu Layang pada Tanah Terkontaminasi Limbah Stronsium terhadap Pertumbuhan
Ageratum Conyzoides dan Amaranthus Viridis**
Devita Armia Purasani, Dr. Ir. Widya Rosita, S.T., M.T., IPU; Dr. Ing. Ir. Kusnanto
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

PENGARUH PENAMBAHAN ABU LAYANG PADA TANAH TERKONTAMINASI LIMBAH STRONSIUM TERHADAP PERTUMBUHAN *AGERATUM CONYZOIDES* DAN *AMARANTHUS VIRIDIS*

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INTISARI

Penambangan timah di Kepulauan Bangka Belitung meninggalkan lahan pascatambang dengan tingkat kesuburan rendah dan pH asam. Kegiatan pertambangan timah menghasilkan *tailing* yang mengandung thorium, uranium, dan stronsium. Kondisi tanah pascatambang yang terdegradasi dapat memengaruhi mobilitas radionuklida, seperti stronsium (Sr-90), apabila terjadi pelepasan ke lingkungan akibat kecelakaan nuklir. Oleh karena itu, diperlukan upaya perbaikan kualitas tanah dan pengendalian ketersediaan Sr di dalam tanah.

Penelitian ini bertujuan mengevaluasi pengaruh *coal fly ash* (CFA), kompos daun, dan kalium humat terhadap sifat tanah pascatambang timah, pertumbuhan tanaman *Ageratum conyzoides* dan *Amaranthus viridis*, serta serapan Sr dalam tanaman. Percobaan dilakukan menggunakan beberapa kombinasi amelioran pada tanah yang dikontaminasi $Sr(NO_3)_2$. Parameter yang diamati meliputi : pertumbuhan tanaman, kandungan Sr dalam tanaman dan tanah, serta nilai BAF. Kandungan Sr pada tanaman dianalisis menggunakan AAS, sedangkan kandungan unsur pada tanah dianalisis menggunakan XRF.

Hasil penelitian menunjukkan bahwa penambahan CFA, kompos, dan kalium humat meningkatkan kualitas tanah. Perlakuan tanah + kompos + humat menghasilkan pertumbuhan terbaik pada kedua tanaman, sedangkan penambahan CFA 20% mulai menunjukkan efek negatif. Kedua tanaman uji tergolong fitoakumulator (BAF > 1). Interaksi humat dan CFA cenderung mengikat Sr dalam tanah sehingga menurunkan penyerapan oleh tanaman.

Kata kunci: Ameliorasi tanah, stronsium, abu layang batubara, kompos daun, kalium humat *Amaranthus viridis, Ageratum conyzoides*.

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THE EFFECT OF COAL FLY ASH ADDITION TO STRONTIUM WASTE-CONTAMINATED SOIL ON THE GROWTH OF *AGERATUM CONYZOIDES* AND *AMARANTHUS VIRIDIS*

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ABSTRACT

Tin mining activities in the Bangka Belitung Islands have resulted in post-mining land characterized by low fertility and acidic soil conditions. In addition, tin mining produces tailing which consist of thorium, uranium, and strontium as a by-product. Degraded post-mining soil conditions may influence the mobility of radionuclides, such as strontium (Sr-90), in the event of their release into the environment as a result of nuclear accidents. Therefore, efforts are needed to improve soil quality while controlling Sr availability in the soil.

This study aimed to evaluate the effects of coal fly ash (CFA), leaf compost, and potassium humate on the properties of tin post-mining soil, the growth of *Ageratum conyzoides* and *Amaranthus viridis*, and Sr uptake by plants. The experiment was conducted using several combinations of soil amendments applied to soil contaminated with $Sr(NO_3)_2$. Observed parameters included plant growth, Sr concentration in plants and soil, and the bioaccumulation factor (BAF). Strontium concentrations in plant tissues were analyzed using Atomic Absorption Spectrophotometer (AAS), while soil elemental composition was determined using X-Ray Fluorescence (XRF).

The results showed that the addition of CFA, compost, and potassium humate improved soil quality. The soil + compost + humate treatment produced the best growth performance in both plant species, whereas the addition of 20% CFA began to exhibit negative effects. Both plant species were classified as Sr phytoaccumulators (BAF > 1). Furthermore, the interaction between humate and CFA tended to immobilize Sr in the soil, thereby reducing its uptake by plants.

Keywords: Soil amelioration, strontium, coal fly ash, leaf compost, potassium humate, *Amaranthus viridis*, *Ageratum conyzoides*.

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