

## LAJU DEKOMPOSISI DAUN EMPAT JENIS TUMBUHAN PIONIR PADA LAHAN BEKAS TAMBANG BATUBARA PT. BERAU COAL KALIMANTAN TIMUR

### INTISARI

Penambangan batubara secara terbuka menimbulkan kerusakan fisik, kimia dan biologi tanah. Salah satu cara yang ekonomis dan efisien untuk mengembalikan kondisi tanah adalah dengan penambahan bahan organik hasil dekomposisi seresah vegetasi pionir. Seresah yang mengalami proses dekomposisi yang cepat, diharapkan akan cepat pula mengembalikan kondisi kesuburan tanah. Penelitian ini bertujuan untuk mengetahui kecepatan dekomposisi seresah daun tumbuhan pionir yang tumbuh pada lahan bekas tambang batubara PT. Berau Coal Kalimantan Timur serta pengaruh naungan terhadap kecepatan dekomposisi.

Penelitian dilakukan dengan menggunakan metode *litter bag* dan rancangan penelitian CRD (*completely randomized design*). Seresah daun *Trema cannabina*, *Macaranga conifera*, *M. triloba* dan *Melastoma affine* setara dengan 15 g berat kering oven dimasukkan dalam *litter bag* (20x20 cm) dan selanjutnya diletakkan pada plot ternaung dan tidak ternaung. Setiap dua minggu dilakukan pengambilan sampel dengan tiga ulangan per jenis tumbuhan dan kondisi dekomposisi. Sampel selanjutnya dioven dan ditimbang. Sebagai data pendukung dilakukan pengamatan kondisi lingkungan (suhu tanah, kelembaban tanah dan intensitas cahaya) dan nisbah C/N awal seresah.

Hasil penelitian menunjukkan bahwa jenis seresah dan naungan menyebabkan perbedaan kecepatan dekomposisi yang signifikan pada taraf uji 0,05. Penurunan berat kering seresah dari yang paling cepat terjadi pada *T. cannabina* yang diikuti oleh *M. conifera*, *M. triloba* dan *M. Affine*. *Trema cannabina* tergolong cepat terdekomposisi dengan nilai indeks dekomposisi ( $k$ ) > 0,01. Sementara itu *M. conifera*, *M. triloba* dan *M. affine* dekomposisinya tergolong menengah dengan nilai  $0,005 < k < 0,01$ . Pada kondisi tanpa naungan, laju dekomposisi seresah lebih cepat dibandingkan kondisi ternaung.

Kata kunci: Laju dekomposisi, seresah, vegetasi pionir, naungan, lahan bekas tambang tambang batubara

## LEAF DECOMPOSITION RATE OF FOUR PIONEER PLANT SPECIES AT AN EX-OPEN CUT COAL MINING AREA OF PT. BERAU COAL, EAST KALIMANTAN

### ABSTRACT

Open cut coal mining degrades soil quality physically, chemically and biologically. Efficient and economical soil restoration methods are needed in order to improve soil conditions to a level similar to those prior to mining operations. Indigenous pioneer plant species which decomposed rapidly are believed to contribute to restore the degraded soil. The objectives of this research are first to determine the decomposition rate of leaf litters of indigenous pioneer plant species which have grown at the ex-open cut coal mining area of PT. Berau Coal East Kalimantan, and secondly to know the effects of shading on the rate of decomposition.

The experiments were performed using litter bag method in completely randomized design (CRD). Leaf litters of *Trema cannabina*, *Macaranga conifera*, *M. triloba*, and *Melastoma affine* (equal to 15 g dried-oven), were filled into litter bags (20 x 20 cm) and placed on shaded, as well as open areas. Samples were taken fourthnightly (three replications of each species and decomposition condition), dried in the oven and weighed. Soil temperature, soil moisture and light intensity, which affected the decomposition rate, were measured. In addition, initial C/N ratios of the litter were analyzed.

The results indicated that plant species, soil temperature, soil moisture and light intensity contributed to the rate of litter decomposition significantly ( $p$ -value 0.05). The fastest litter decomposition rate was shown by *T. cannabina*, followed by *M. conifera*, *M. Triloba*, and *M. affine*. Since the decomposition index ( $k$ ) of litter of *T. cannabina* was  $>0.01$ , it was classified as a rapid rate decomposition. Values of ( $k$ ) for other three pioneer plant species were  $0.005 < k < 0.01$ , hence they were classified as medium rate decomposition. In addition, the rate of litter decomposition on the open area was faster than that of shaded area.

Keywords: decomposition rate, leaf litter, pioneer plant species, ex-open cut coal mining