

ABSTRACT

ISOLATION AND IDENTIFICATION OF BACTERIAL DIVERSITY ON TEPHRA MOUNTAIN ANAK KRAKATAU POST ERUPTION DECEMBER 2018

By

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The eruption of Mount Anak Krakatau (GAK) in December 2018 caused significant morphological changes and land damage in the form of deposition of new pyroclastic material and the destruction of all pioneer vegetation. Pyroclastic material (tephra) contains primary minerals that have a positive impact on the formation of soil fertility and biodiversity. This exploratory research aims to identify the population, diversity, and dominance of soil bacteria in GAK's tephra after the December 2018 eruption.

Sampling of GAK's tephra was carried out using toposquence on 4 different profiles and 19 samples were obtained. Isolation and calculation of the bacterial population used the Total Plate Count (TPC) method with three replications (triplo) in each dilution. Then, identification of bacterial morphology, purification of bacterial isolates, and testing of bacterial isolates in high temperature was performed.

The results showed that the total population of GAK's tephra bacteria was still low. In general, the total population of bacteria from the top layer to the bottom layer decreased. Meanwhile, in toposquence, the highest total bacterial population was found in profile 3 with 3.41 Log CFUg⁻¹ and the lowest total bacterial population was found in profile 4 with 1.98 Log CFUg⁻¹. The level of diversity (H') of GAK's tephra bacteria is low, ranging from 0 – 0.92, means that the level of bacterial dominance is high ($D = 0.5 - 1$). The group of bacteria that dominates in tephra are thermophilic bacteria that are able to grow within the temperatures of 40°C and 45°C.

Keywords: dominance (D), diversity (H'), tephra GAK, total bacterial population (CFUg⁻¹).

ABSTRAK

ISOLASI DAN IDENTIFIKASI KEANEKARAGMAN BAKTERI PADA TEPHRA GUNUNG ANAK KRAKATAU PASCA ERUPSI DESEMBER 2018

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Erupsi Gunung Anak Krakatau (GAK) pada Desember 2018 menyebabkan perubahan morfologi dan kerusakan lahan yang signifikan berupa pengendapan material piroklastik baru dan musnahnya seluruh vegetasi pionir. Material piroklastik (tephra) mengandung mineral primer yang berdampak positif bagi pembentukan kesuburan tanah dan keanekaragaman hayati. Penelitian eksplorasi ini bertujuan untuk mengidentifikasi populasi, keanekaragaman, dan dominansi bakteri tanah pada tephra GAK pasca erupsi Desember 2018.

Pengambilan sampel tephra GAK dilakukan secara *toposquence* pada 4 profil berbeda dan diperoleh 19 sampel. Isolasi dan perhitungan populasi bakteri dilakukan dengan metode *Total Plate Count* (TPC) sebanyak tiga ulangan (triplo) pada setiap pengenceran. Selanjutnya, dilakukan identifikasi morfologi bakteri, pemurnian isolat bakteri, dan pengujian isolat bakteri pada suhu tinggi.

Hasil penelitian menunjukkan total populasi bakteri tephra GAK tergolong masih rendah. Secara umum total populasi bakteri dari lapisan atas ke lapisan bawah mengalami penurunan. Sedangkan, secara *toposquence* total populasi bakteri tertinggi terdapat pada profil 3 sebesar $3,41 \text{ Log CFUg}^{-1}$ dan total populasi bakteri terendah terdapat pada profil 4 sebesar $1,98 \text{ Log CFUg}^{-1}$. Tingkat keanekaragaman (H') bakteri tephra GAK tergolong rendah berkisar $0 - 0,92$ sehingga, tingkat dominansi bakteri tergolong tinggi ($D = 0,5 - 1$). Kelompok bakteri yang mendominasi pada tephra yaitu bakteri termofilik yang mampu tumbuh pada cekaman suhu 40°C dan 45°C .

Kata kunci: dominansi (D), keanekaragaman (H'), tephra GAK, total populasi bakteri (CFUg^{-1}).