

**CIRI KIMIA DAN BIOLOGI TANAH SERTA KORELASINYA
TERHADAP AKTIVITAS ENZIM HIDROLASE PADA LAHAN
HORTIKULTURA DI NAGARI ALAHAN PANJANG
KABUPATEN SOLOK**



Oleh:

SRI DEWI MURNI
1720232005

Pembimbing :

1. Dr. Ir. Agustian
2. Dr. Mimien Harianti, SP. MP

**PROGRAM MAGISTER ILMU TANAH
FAKULTAS PERTANIAN
UNIVERSITAS ANDALAS
PADANG
2021**

CIRI KIMIA DAN BIOLOGI TANAH SERTA KORELASINYA TERHADAP AKTIVITAS ENZIM HIDROLASE PADA LAHAN HORTIKULTURA DI NAGARI ALAHAN PANJANG KABUPATEN SOLOK

ABSTRAK

Nagari Alahan Panjang merupakan salah satu daerah Sentra Hortikultura terbesar di Sumatera Barat yang memiliki luas lahan 1.948,3 ha. Di daerah ini, budidaya tanaman hortikultura dilakukan secara intensif pada kelerengan 0-8% dan 8-15% dengan penggunaan lahan yang menggunakan pola tanam monokultur, rotasi dan tumpangsari. Penelitian ini bertujuan untuk mengkaji ciri kimia dan biologi tanah serta aktivitas enzim hidrolase pada pola tanam dengan kelerengan berbeda di lahan hortikultura Nagari Alahan Panjang. Penelitian ini dilakukan dalam bentuk survei dengan pengambilan sampel tanah dilakukan secara *purposive sampling* berdasarkan 3 pola tanam, yaitu monokultur (BM), rotasi (BM/C), dan tumpangsari (BM+BD) pada dua kelerengan. Parameter yang diamati meliputi ciri kimia dan biologi tanah terdiri dari pH, C-organik, N-total, C/N, KTK, P-tersedia, K-dd, Ca-dd, Mg-dd, Na-dd, respirasi, kandungan biomassa, total populasi mikroba dan enzim hidrolase (β -glukosidase, fosfatase asam, fosfatase basa). Hasil penelitian menunjukkan bahwa ciri kimia, biologi tanah dan aktivitas enzim hidrolase pola tanam BM+BD (tumpangsari) memiliki ciri kimia dan biologi terbaik : pH 6,3; C-organik 3,39%; N-total 0,36%; KTK 39,08me/100g; Mg-dd 0,58me/100g, repirasi 62,58 mgCO₂/m₂/hari; biomassa C 0,030 mgC/gtanah. Enzim fosfatase asam terbaik pada pola tanam BM : 0,065 μ mol/ g tanah/jam, aktivitas enzim fosfatase basa dan β -glukosidase terbaik pada pola tanam BM+BD : 0,059 μ mol/ g tanah/jam dan 0,0074 μ mol/ g tanah/jam. Ciri kimia dan biologi tanah yang terbaik ditemukan pada kelerengan 0-8%. Enzim hidrolase kelerengan 0-8% berkorelasi positif dengan C-organik $r=0,563$, KTK= $0,694$, dan respirasi $r=0,708$. Pada kelerengan 8-15% berkorelasi positif dengan C-organik $r=0,511$ dan KTK $r=0,512$.

Kata Kunci : *Aktivitas enzim hidrolase, Alahan Panjang, Ciri kimia tanah, Lahan hortikultura, Pola tanam*

CHEMICAL AND BIOLOGICAL CHARACTERISTICS OF SOIL AND ITS CORRELATION TO HYDROLASE ENZYME ACTIVITIES IN HORTICULTURAL LAND IN ALAHAN PANJANG SOLOK REGENCY



ABSTRACT

Nagari Alahan panjang is the largest (1,9438 ha) horticultural land in West Sumatera. The area was intensively cultivated on slope of 0-8% and 8-15% with monoculture, rotation, and intercropping patterns. This study was aimed to examine the chemical and biological characteristics of soil as well as the activity of hydrolase enzymes in the cropping patterns at different slopes in Nagari Alahan Panjang. This research was conducted using survei method. Soil was sampled purposively sampling based on 3 cropping patterns (monoculture *Allium cepa* (BM), rotation *Allium cepa*-*Capsicum annum* (BM/C), and intercropping *Allium fistulosum* (BM+BD)) on 2 slope levels. The parameters observed included the chemical and biological characteristics of the soil, especially soil pH, organic-C, total-N, C/N, CEC, P-available, K-exch, Ca-exch, Mg-exch, Na-exch, respiration, biomass content, total microbial population, and hydrolase enzymes (β -glucosidase, acid phosphatase, alkaline phosphatase). The results showed that the (BM+BD) intercropping showed the best chemical and biological characteristics among the cropping patterns. It had pH 6.3; C-organic was 3.39%; N-total was 0.36%; CEC was 39.08 me/100g; Mg-dd was 0.58 me/100g, respiration was 62.58 mgCO₂/g/m₂/day; biomass C was 0.030 mgC/g soil. The best acid phosphatase enzyme was found under monoculture (BM) cropping pattern. It had 0.065 micromole/g soil. The best activity of alkaline phosphatase and β -glucosidase enzymes was found in intercropping (BM+BD) pattern with 0.059 micromole/g soil and 0.0074 micromole/g soil. Soil fertility was found better at 0-8% than at 8-15% slope. Enzymes in the slope 0-8% positively correlated to org-C ($r = 0.563$), CEC ($r = 0.694$), and respiration ($r = 0.708$). At 8-15% slope, the enzyme correlated to org-C ($r = 0.511$) and CEC ($r = 0.512$).

Keywords: Alahan Panjang, Cropping patterns, chemical characteristics, horticultural land, hydrolase enzyme activity