

## Intisari

Enzim 1-aminocyclopropane-1-carboxylate deaminase mengkatalis degradasi 1-aminocyclopropane-1-carboxylic acid (ACC), prekursor intermediate hormon etilen, menjadi  $\alpha$ -ketobutirat dan amonia. Enzim ini dapat ditemukan pada beberapa bakteri dan berperan penting untuk melangsungkan pertumbuhan dan perkembangan tanaman meskipun pada kondisi cekaman biotik dan abiotik dengan jalan mengurangi produksi kelebihan etilen di tanaman. Penelitian ini ditujukan untuk memperoleh bakteri penghasil ACC Deaminase yang diisolasi dari perakaran bawang merah, cabe, dan kentang yang diperoleh dari daerah Kulon Progo, Yogyakarta dan dataran tinggi Dieng, Jawa Tengah. Isolasi dilakukan dengan metode *surface plating* pada medium nutrisi agar. Seleksi kualitatif berdasarkan pertumbuhan isolat pada medium minimal DF salt dengan ACC sebagai sumber nitrogen, dan seleksi kuantitatif berdasarkan uji aktivitas ACC deaminase. Diantara 44 isolat, 5 isolat dapat menggunakan substrat ACC dengan baik dan menunjukkan aktivitas enzim antara 8,296 - 19,535  $\mu\text{mol NH}_4^+ \cdot \text{mg}^{-1} \cdot \text{jam}^{-1}$ . Pada karakterisasi morfologi menunjukkan lima isolat berbentuk batang dan bersifat gram negatif, sedangkan hanya satu isolat (CB2) yang bersifat gram positif. Karakterisasi ketahanan terhadap antibiotik menghasilkan lima isolat tidak tahan terhadap Ciprofloxacin, sedang pada antibiotik Kanamisin hanya isolat BK1 yang menghasilkan MIC 260 ppm. Sementara MIC isolat terhadap antibiotik Ampisilin antara 80-180 ppm. Berdasarkan sekuen gen 16SrRNA, isolat BK1, CB2, CK4, KB6.2 dan KW3 berturut-turut teridentifikasi sebagai *Spingobacterium caeni*, *Bacillus mycoides*, *Pantoea dispersa*, *Pantoea agglomerans*, *Enterobacter ludwigii*.

Kata kunci : Bawang Merah, Cabe, Kentang, Etilen, ACC Deaminase

## Abstract

The enzyme 1-aminocyclopropane-1-carboxylate deaminase catalyzes the degradation 1-aminocyclopropane-1-carboxylic acid (ACC), immediate precursor of the plant hormon ethylene, into  $\alpha$ -ketobutyrate and ammonia. The enzyme can be detected in limited numbers of bacteria and plays a significant role in the growth and development of plant even though under stress of biotic and abiotic conditions by reducing stress induced ethylene production in plants. This study was aimed to obtain ACC Deaminase producing bacterias isolated from plants root of red onion, chilli, and potato in Kulon Progo, Yogyakarta and Dieng Plateu, Jawa Tengah. Isolation was conducted by surface plating on nutrient agar medium. Qualitative selection was based on the growth of isolates in minimal medium DF salt supplemented with ACC as a nitrogen source, and a selection of quantitative based on ACC deaminase activity assay. Among the 44 isolates, 5 were found to be positive for ACC and showed the activity between 8,296 to 19,535  $\mu\text{mol NH}_4^+.\text{mg}^{-1}.\text{jam}^{-1}$ . In the morphology characterisation by microscopic cell, five isolates were rod shape and gram-negative bacteria, only one (CB2) was gram-positive. By characterizing the antibiotic resistance, five isolates were found unresisting to Ciprofloxacin while in Kanamycin, only BK1 that produces MIC up to 260 ppm. Meanwhile, for Ampicilin, there were found MIC isolates ranged between 80 to 180 ppm. Regarding to 16S rRNA sequence analysis, the results showed that BK1, CB2, CK4, KB6.2 and KW3 isolates were identified respectively as *Spingobacterium caeni*, *Bacillus mycoides*, *Pantoea dispersa*, *Pantoea agglomerans*, *Enterobacter ludwigi*.

Keywords : Red Onion, Chili, Potato, Ethylene, ACC Deaminase