

## INTISARI

Merkuri (Hg) yang berada dalam tanah dan air dapat menjadi faktor cekaman bagi tanaman. Sumber cemaran merkuri tidak hanya berasal dari kegiatan pertambangan, namun juga dapat berasal dari limbah industri dan kegiatan pertanian. Upaya dalam mengurangi pencemaran Hg di lingkungan dapat dilakukan melalui fitoremediasi. Dalam upaya mengoptimalkan fitoremediasi perlu ditambahkan bakteri penghasil ACC-deaminase. Bakteri penghasil *1-aminocyclopropane-1- carboxylic acid Deaminase* (ACCD) dapat mendukung pertumbuhan tanaman yang terpapar cekaman dengan mengurangi biosintesis etilen. Penelitian ini bertujuan untuk mengetahui peran bakteri penghasil ACCD terhadap pertumbuhan dan serapan Hg oleh tanaman *Celosia argentea* yang terpapar Hg 2 – 50 ppm. Strain bakteri penghasil ACCD : *Pantoea dispersa* CK4, *Pseudomonas monteilii* KS-12, *Raoultella terrigena* PCM-8, dan *Pseudomonas putida* UW-4 digunakan sebagai inokulum pertanaman *C. argentea* dalam tanah Inceptisol pada percobaan pot. Pertumbuhan vegetatif diamati pada umur tanaman 12 minggu setelah tanam (MST) meliputi berat kering tajuk dan akar. Selain itu juga dilakukan pengukuran serapan Hg oleh tanaman menggunakan *mercury analyser*, serta analisis populasi bakteri penghasil ACCD dengan metode *spread plating*. Hasil pengamatan menunjukkan bahwa inokulasi bakteri penghasil ACCD mampu mendukung pertumbuhan *C. argentea* dengan meningkatkan bobot tanaman 37-69% dan keragaan tanaman. Demikian halnya dengan serapan Hg oleh *C. argentea* meningkat 53-86% karena inokulasi. Populasi bakteri penghasil ACCD menurun 33,3-83,3% selama 80 hari inkubasi dalam tanah yang mengandung 2-50 ppm Hg.

Kata kunci : Merkuri, *Celosia argentea*, bakteri penghasil ACC-Deaminase, tanah inceptisol.

## ABSTRACT

Mercury (Hg) in soil and water may become a stress factor for plants. Sources of mercury contamination may not only originated from mining activities, but also from industrial waste and agricultural activities. Hg pollution in the environment may be overcome by employing phytoremediation approach. Phytoremediation optimisation may be carried out by using ACC-deaminase-producing bacteria to support plant growth. Bacteria that produce 1-aminocyclopropane-1-carboxylic acid deaminase (ACCD) can support the growth of plants exposed to stress by reducing ethylene biosynthesis. This study aims at determining the role of ACCD-producing bacteria on the growth and uptake of Hg by *Celosia argentea* plants exposed to Hg 2 – 50 ppm. ACCD-producing bacterial strains: *Pantoea dispersa* CK4, *Pseudomonas monteilii* KS-12, *Raoultella terrigena* PCM-8, and *Pseudomonas putida* UW-4 were used as inoculants for *C. argentea* in Inceptisol soil cultivated in pot experiments. Vegetative growth was observed at the age of 12 weeks after planting that included shoot and root dry weight. In addition, measurements of Hg uptake by plants using a mercury analyser was also carried out, as well as an analysis of the population of ACCD-producing bacteria by using spread plating method. The results showed that inoculation of ACCD-producing bacteria was able to improve the growth and plant performance of *C. argentea* by increasing plant weight by 37-69%. In addition, Hg uptake by *C. argentea* was also found increased by 53-86% as a result of inoculation. The population of ACCD-producing bacteria decreased from 33.3 to 83.3% during 80 days of incubation in soil containing 2-50 ppm Hg.

Keywords: Mercury, *Celosia argentea*, ACC-Deaminase producing bacteria, inceptisol.