

**PENGARUH CEKAMAN LOGAM TIMBAL ($PbCl_2$) TERHADAP
KADAR PROLIN DAN KARAKTER MORFOLOGIS KULTIVAR PADI
(*Oryza sativa* L.) MERAH**

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INTISARI

Logam Pb termasuk dalam unsur non esensial bagi tanaman. Apabila tanaman terpapar Pb dalam konsentrasi melebihi ambang batas maka akan menimbulkan gejala keracunan. Tanaman yang tercekam akibat cekaman logam Pb akan melakukan serangkaian mekanisme untuk beradaptasi salah satunya adalah dengan meningkatkan kadar prolin. Penelitian ini bertujuan untuk mengetahui pengaruh cekaman logam Pb terhadap kadar prolin dan morfologi kultivar padi merah. Langkah awal yang dilakukan adalah skrining terhadap tujuh kultivar padi merah. Bibit ditanam dengan sistem hidroponik menggunakan larutan nutrisi Yoshida. Kemudian diberikan $PbCl_2$ dengan konsentrasi 0 ppm, 250 ppm, 500 ppm, 750 ppm, 1000 ppm, dan 1250 ppm secara bertingkat setiap 5 hari. Pengukuran kadar prolin dilakukan dengan metode *Ninhydrin-based Colorimetric Assay* pada cekaman 0 ppm, 500 ppm, 1000 ppm, dan 1250 ppm terhadap kultivar tahan dan tidak tahan. Berdasarkan hasil skrining, didapatkan kultivar tahan adalah kultivar Segreng dan kultivar tidak tahan adalah kultivar Merah Pari Eja berdasarkan pengukuran pada parameter panjang akar, tinggi tanaman, kerusakan daun, penggulangan daun, dan persentase *Relative Water Content* (RWC). Berdasarkan uji kadar prolin, diketahui bahwa akumulasi prolin tertinggi terdapat pada kultivar Segreng namun tidak terdapat perbedaan yang signifikan antara kadar prolin Segreng dan Merah Pari Eja pada cekaman 1250 ppm. Penelitian ini menunjukkan bahwa semakin tinggi konsentrasi logam Pb maka akan semakin menghambat pertumbuhan panjang akar, tinggi tanaman, persentase RWC, serta semakin meningkatkan kerusakan daun, penggulangan daun, dan kadar prolin.

Kata kunci : cekaman logam timbal, kadar prolin, Segreng, Merah Pari Eja

EFFECT OF LEAD ($PbCl_2$) STRESS ON PROLINE LEVELS AND MORPHOLOGICAL CHARACTERS OF RED RICE (*Oryza sativa* L.) CULTIVARS

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ABSTRACT

Pb is a non-essential element for plants. If the plant is exposed to Pb in concentrations exceeding the threshold, it will cause symptoms of poisoning. Plants that are stressed due to Pb stress will carry out a series of mechanisms to adapt, one of which is by increasing proline levels. This study aimed to determine the effect of Pb stress on proline levels and morphology of red rice cultivars. The initial step taken was a screening of seven red rice cultivars. Seedlings are grown with a hydroponic system using Yoshida nutrient solution and then given $PbCl_2$ with concentrations of 0 ppm, 250 ppm, 500 ppm, 750 ppm, 1000 ppm, and 1250 ppm in stages every 5 days. Proline levels were measured using the *Ninhydrin-based Colorimetric Assay* method at stresses of 0 ppm, 500 ppm, 1000 ppm, and 1250 ppm for resistant and non-resistant cultivars. Based on the screening results, the resistant cultivar was the Segreng cultivar and the non-resistant cultivar was the Merah Pari Eja cultivar based on measurements of root length, plant height, leaf damage, leaf curl, and the percentage of Relative Water Content (RWC). Based on the proline level test, it was found that the highest proline accumulation was found in the Segreng cultivar but there was no significant difference between the proline levels of Segreng and Merah Pari Eja at 1250 ppm stress. This study showed that the higher the concentration of Pb metal, the more inhibited the growth of root length, plant height, percentage of RWC, and further increased leaf damage, leaf curl, and proline content.

Keywords : lead stress, proline levels, Segreng, Merah Pari Eja