

Pengaruh Asam Salisilat Terhadap Kandungan Hormon Endogen, Betasianin, Dan Pertumbuhan Bayam Merah (*Amaranthus tricolor* L.)

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19/447356/PBI/01635

INTISARI

Amaranthus tricolor L. mengandung vitamin dan zat gizi berupa betasianin yang merupakan pigmen warna ungu kemerahan yang terlarut dalam air, berfungsi sebagai antioksidan. Namun demikian, bayam merah juga mengandung zat yang merugikan yaitu asam oksalat. Asam salisilat diketahui mampu meningkatkan kualitas bayam merah salah satunya dengan meningkatkan produksi senyawa antioksidan seperti kandungan vitamin C dan menurunkan senyawa oksalat. Tujuan dari penelitian ini untuk mengevaluasi peran asam salisilat terhadap kandungan hormon endogen, betasianin dan pertumbuhan pada bayam merah. Pada penelitian ini digunakan Rancangan Acak Lengkap dengan faktor tunggal. Biji bayam merah direndam dalam air hangat ± 60 menit, kemudian dikecambahkan dalam pot yang telah diisi media tanam. Tanaman bayam merah yang sudah berusia 2 minggu diberi perlakuan asam salisilat, terdiri dari 5 konsentrasi yaitu kontrol, 10^{-8} M, 10^{-6} M, 10^{-4} M, dan 10^{-2} M dengan masing-masing perlakuan dibuat 5 ulangan. Parameter pertumbuhan yang diamati yaitu tinggi batang, jumlah daun, luas daun, panjang akar, bobot basah dan kering tajuk serta akar, kadar asam oksalat diukur dengan metode titrasi permanganometri, kerapatan kristal Ca-oksalat pada batang dilakukan dengan pembuatan preparat metode *free hand section*. Kandungan metabolit sekunder seperti kandungan vitamin C diukur dengan metode titrasi pada larutan iodin. Kadar betasianin dan hormon endogen diukur dengan HPLC (*High Performance Liquid Chromatography*). Hasil dianalisis dengan One Way ANOVA pada tingkat kepercayaan 95% dan dilanjutkan dengan uji DMRT pada taraf signifikan 5% apabila terdapat beda nyata. Hasil Penelitian menunjukkan bahwa hormon endogen bayam merah meningkat dengan aplikasi SA 10^{-4} M. Semua konsentrasi SA yang diterapkan mampu menurunkan kandungan asam oksalat dan kerapatan kristal Ca-oksalat pada batang dan akar. Tinggi tanaman, jumlah daun, luas daun dan panjang akar cenderung meningkat dengan aplikasi SA 10^{-8} M. Asam salisilat konsentrasi 10^{-6} M secara nyata meningkatkan kandungan vitamin C, kemudian SA konsentrasi 10^{-4} M meningkatkan kandungan betasianin. Dapat disimpulkan bahwa aplikasi SA meningkatkan kualitas nutrisi dari bayam merah.

Kata Kunci : Bayam merah, Asam Salisilat, Hormon Endogen, Senyawa Oksalat, Vitamin C, dan Betasianin

The Effect Of Salicylic Acid On Endogenous Content Of Hormone Content And Growth Of Red Spinach (*Amaranthus tricolor* L.)

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ABSTRACT

Amaranthus tricolor L. contains vitamins and nutrition substances in the form of betacyanin, which is a pigment that gives purple reddish color for leaves dissolved in water, and functions as an antioxidant. However, red spinach also contains harmful substances, namely oxalic acid. Salicylic acid is known able to improve the quality of red spinach, one of which is by increasing the production of antioxidant compounds such as vitamin C content and reducing oxalate compounds. This study aims to evaluate the role of salicylic acid on endogenous hormone content, betacyanin, and growth in red spinach. In this study, Design Randomized Complete with factor single design was used. Seeds of spinach red soaked in water warm \pm 60 minutes, then germinated in pots that have filled the media planting. Two-week-old red spinach plants were given the SA treatment, which consisted of five concentrations: control 10^{-8} M, 10^{-6} M, 10^{-4} M, and 10^{-2} M, with 5 replications for each treatment. The growth parameters observed were stem height, the number of leaves, yield in the form of wet and dry weights of shoots and roots. Oxalic acid levels were measured by the permanganometri titration method, while Ca-oxalate crystal density in stems was carried out by making preparations using the *freehand section* method. The content of secondary metabolites such as vitamin C content was measured by titration method in iodine solution. Betacyanin and endogenous hormone levels were measured by HPLC (*High-Performance Liquid Chromatography*). The results were analyzed by One Way ANOVA at the 95% confidence level and continued with the DMRT test at the 5% level if there was a significant difference. Red spinach endogenous hormone increased with the application of SA 10^{-4} M. The content of oxalic acid and the density of Ca-oxalate crystals in stems and roots were reduced at all concentrations of SA used. The results revealed that plant height, number of leaves, leaf area and root length tended to increase with the application of SA 10^{-8} M. Salicylic acid concentration of 10^{-6} M significantly increased vitamin C content, as well as SA concentration of 10^{-4} M, was able to increase the content of betacyanin. In conclusion, adding SA to red spinach improves its nutritional quality.

Keywords: Red Spinach, Salicylic Acid, Endogenous Hormones, Oxalate Compounds, Vitamin C, and Betacyanin.