

PERTUMBUHAN, KADAR OKSALAT DAN ANTOSIANIN BAYAM MERAH (*Amaranthus tricolor L.*) HASIL PERLAKUAN ASAM SALISILAT

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INTISARI

Peningkatan kualitas bayam merah (*Amaranthus tricolor L.*) salah satunya dilakukan dengan meningkatkan produksi antosianin dan menurunkan kadar senyawa oksalat. Asam salisilat (SA) adalah salah satu hormon yang dapat digunakan untuk meningkatkan antosianin dan menurunkan senyawa oksalat dalam tanaman. Tujuan dari penelitian ini untuk mengevaluasi peran asam salisilat terhadap pertumbuhan, kadar senyawa oksalat, dan antosianin pada bayam merah. Pada penelitian ini tanaman bayam merah berusia 3 minggu diberi perlakuan SA dengan konsentrasi 10^{-2} M, 10^{-4} M, 10^{-6} M, 10^{-8} M, dan kontrol dengan masing-masing perlakuan dibuat 5 ulangan. Tanaman ditumbuhkan selama 2 minggu dan diukur panjang akar, berat kering akar, tinggi tanaman, dan berat kering tajuk. Batang diiris melintang dengan metode *free-hand section* lalu diamati jaringan penyusunnya dan dihitung kerapatan kristal Ca-oksalat. Kandungan metabolit sekunder seperti antosianin, klorofil dan karotenoid diukur dengan spektrofotometri dan asam oksalat diukur dengan titrasi permanganometri. Hasil dianalisis dengan One Way ANOVA pada tingkat kepercayaan 95% dan dilanjutkan dengan uji DMRT pada taraf 5% apabila terdapat beda nyata. Hasil penelitian menunjukkan, perlakuan SA konsentrasi 10^{-2} M signifikan dalam menurunkan panjang akar, berat kering akar dan tinggi tanaman, sedangkan berat kering tajuk tidak berbeda nyata dibanding kontrol. Perlakuan SA konsentrasi 10^{-2} M juga secara signifikan menurunkan kadar klorofil dan karotenoid, selain itu semakin tinggi konsentrasi asam salisilat, kadar asam oksalat dan kristal Ca-oksalat semakin berkurang. Kadar antosianin tertinggi diperoleh pada tanaman yang diberi perlakuan SA dengan konsentrasi 10^{-6} M. Perlakuan SA konsentrasi lebih dari 10^{-2} M, menyebabkan pembentangan sel pada jaringan kolenkim dan parenkim pada korteks dan empulur. Berdasarkan hasil tersebut, disimpulkan bahwa asam salisilat meningkatkan kualitas bayam merah terutama dalam penurunan kadar senyawa oksalat.

Kata kunci: *Amaranthus tricolor L.*, antosianin, asam salisilat, oksalat

GROWTH, OXALATE AND ANTHOCYANIN CONTENT OF RED AMARANTH (*Amaranthus tricolor* L.) TREATED WITH SALICYLIC ACID

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ABSTRACT

Increased quality of red amaranth (*Amaranthus tricolor* L.) can be done by increasing the production of anthocyanin and lowering the oxalate compound. Salicylic acid (SA) is one of the plant hormones that can be used to increase anthocyanin and decrease oxalic compounds in plants. This study aimed to evaluate salicylic acid effects toward growth, oxalate and anthocyanin content in red amaranth. In this study, the 3-week-old red amaranth plants were given SA treatment with concentrations of 10^{-2} M, 10^{-4} M, 10^{-6} M, 10^{-8} M, and one group with no treatment which act as the control group. Five plants are prepared for each treatment. The plants were grown for 2 weeks and root length, dried root weight, plant height, and dried shoot weight of each plants were measured and weighed. The stems were cross-sectioned using free-hand section technique and then the constituent tissue and density of the Ca-oxalate crystals were observed. Secondary metabolites such as anthocyanins, chlorophylls and carotenoids were measured by spectrophotometry and oxalic acid was measured by permanganometric titration. The results were analyzed by One Way ANOVA at 95% confidence level and continued with DMRT test at 5% level if there was a real significance. In this study, SA concentration of 10^{-2} M was significant in decreasing root length, dried root weight and crown height, whereas in dry weight of canopy showed no significant difference compared with control. Treatment of SA concentrations of 10^{-2} M significantly decreased levels of chlorophyll and carotenoids, as well as the higher concentrations of salicylic acid can decrease the levels of oxalic acid and Ca-oxalic crystals. The highest anthocyanin content was observed in the treatment of SA concentrations of 10^{-6} M. SA treatment with concentration more than 10^{-2} M, caused expansion of cells in the collenchyma and parenchyma on the cortex and parenchyma tissues on the pith. Based on these results, SA concentration of 10^{-2} M improved the quality of red amaranth particularly proven by the decreasing levels of oxalate compounds.

Keywords: *Amaranthus tricolor* L., anthocyanin, salicylic acid, oxalate