

PERTUMBUHAN, KADAR ANTIOKSIDAN ALAMI DAN ASAM OKSALAT BAYAM MERAH (*Amaranthus tricolor* L.) HASIL PERLAKUAN METIL JASMONAT

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INTISARI

Amaranthus tricolor L. mengandung beberapa senyawa antioksidan seperti karotenoid dan asam askorbat, selain itu bayam merah mengandung antosianin. Namun demikian, bayam merah juga mengandung asam oksalat. Metil jasmonat diketahui mampu meningkatkan biosintesis metabolit sekunder, seperti antosianin dan beberapa antioksidan. Penelitian ini bertujuan untuk mengevaluasi efek metil jasmonat terhadap pertumbuhan, kadar asam oksalat dan antioksidan alami pada *Amaranthus tricolor* L. Penelitian ini dilaksanakan di Green House Fakultas Biologi UGM, dan Laboratorium Fisiologi Tumbuhan Fakultas Biologi UGM pada bulan Februari-Oktober 2018. Penelitian ini menggunakan Rancangan Acak Lengkap dengan faktor tunggal yaitu perlakuan metil jasmonat, terdiri dari 5 konsentrasi yaitu kontrol, 100 μM , 200 μM , 300 μM , dan 400 μM . Biji bayam dikecambahkan dan benih yang berumur 2 minggu ditanam pada pot plastik berisi media tanam (campuran tanah dan kompos dengan perbandingan 2:1). Aplikasi metil jasmonat dilakukan saat tanaman berumur 14 hari. Parameter pertumbuhan yang diamati yaitu tinggi tanaman, berat basah tajuk, berat kering tajuk, luas daun, panjang akar, berat basah akar, berat kering akar, kadar klorofil, kadar asam oksalat, serta kandungan antioksidan alami bayam merah berupa kadar karotenoid, kadar asam askorbat, dan kadar antosianin. Kadar klorofil dan karotenoid diukur dengan metode spektrofotometri, kadar asam askorbat dengan metode titrasi pada larutan iodin, kadar antosianin diukur dengan metode *pH differential*, dan kadar asam oksalat diukur dengan metode titrasi secara permanganometri. Data dianalisis menggunakan ANOVA pada tingkat kepercayaan 95% dan dilanjutkan dengan uji DMRT pada taraf 5%. Hasil penelitian menunjukkan bahwa pemberian metil jasmonat tidak mempengaruhi pertumbuhan vegetatif dan kadar klorofil bayam merah, namun mampu meningkatkan kadar karotenoid pada konsentrasi 100 μm , kadar asam oksalat, kadar asam askorbat serta kadar antosianin pada konsentrasi 400 μm .

Kata kunci: Bayam merah (*Amaranthus tricolor* L.), metil jasmonat, antosianin, antioksidan, asam oksalat

GROWTH, OXALIC ACID AND NATURAL ANTIOXIDANT CONTENT OF RED AMARANTH (*Amaranthus tricolor* L.) TREATED WITH METHYL JASMONATE

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ABSTRACT

Amaranthus tricolor. L has several antioxidant compounds including carotenoid and ascorbic acid, furthermore red amaranth has anthocyanin content. However, red amaranth also has oxalic acid. Methyl jasmonate can increase production of secondary metabolite, especially antioxidant. This research was intended to evaluate the effect of methyl jasmonate on growth, oxalic acid content and natural antioxidant content of *Amaranthus tricolor* L. This research was conducted on February 2018 until October 2018 at Greenhouse and Laboratory of Plant Physiology, Faculty of Biology UGM. This research used a Completely Randomized Design with single factor, with methyl jasmonate concentration consisted of 0 μM (control), 100 μM , 200 μM , 300 μM , and 400 μM . The amaranth seeds were germinated and planted in plastic pots containing planting media (mixture of soil and compost in a ratio of 2:1). The application of methyl jasmonate was carried out when the plants were 14 days old. Growth parameters measured were plant height, plant fresh weight and dry weight, leaf area, root length, root fresh weight and dry weight, chlorophyll content, oxalic acid content, and natural antioxidant content of red spinach observed were carotenoid content, ascorbic acid content and anthocyanin content. The content of chlorophyll and carotenoid were measured by spectrophotometric methods, ascorbic acid content was measured by iodine titration methods, anthocyanin content was measured by differential pH method, and oxalic acid content was measured by permanganometric titration method. Data were analyzed using ANOVA test at 95 % and continued by DMRT test at 5% confidence level. The results showed that methyl jasmonate did not affect vegetative growth and chlorophyll content of red spinach, but increased carotenoid content at 100 μm , oxalic acid content, ascorbic acid content and anthocyanin content at 400 μm .

Key word: Red Amaranth (*Amaranthus tricolor* L.), methyl jasmonate, anthocyanin, antioxidant, oxalic acid