

PENGARUH ASAM HUMAT PADA PERTUMBUHAN, HASIL, KADAR ASAM OKSALAT DAN BETASIANIN DAUN BAYAM MERAH

(*Amaranthus tricolor* L.)

Fitri Lestari

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ABSTRAK

Asam humat merupakan biostimulan yang mempunyai muatan negatif dan mampu berikatan dengan kation-kation yang penting dalam proses pertumbuhan tanaman. Bayam merah (*Amaranthus tricolor* L.) mengandung zat gizi berupa betasianin yang merupakan pigmen warna ungu kemerahan yang terlarut dalam air berfungsi sebagai antioksidan, tetapi juga mengandung zat anti gizi berupa oksalat yang menghambat penyerapan kalsium dalam tubuh. Penelitian ini bertujuan untuk mengevaluasi pengaruh asam humat yang diberikan melalui daun dan sistem perakaran terhadap pertumbuhan, hasil, kadar asam oksalat dan betasianin daun tanaman bayam merah (*Amaranthus tricolor* L.). Biji bayam merah dikecambahkan dalam *polybag* dengan media tanam tanah. Asam humat diberikan ke tanaman saat berumur 2 minggu dengan variasi konsentrasi 0 mg/L, 5 mg/L, 20 mg/L dan 35 mg/L masing-masing melalui daun dan sistem perakaran. Parameter pertumbuhan yang diamati yaitu tinggi batang dan jumlah daun, hasil berupa bobot tajuk dan akar, kadar asam oksalat diukur dengan metode titrasi permanganometri, kerapatan kristal Ca-oksalat pada batang dilakukan dengan pembuatan preparat metode *free hand section*, kadar betasianin ditentukan menggunakan HPLC (*High Performance Liquid Chromatography*) dan kadar klorofil diukur dengan metode spektrofotometri. Data hasil pengamatan dianalisis menggunakan *One Way ANOVA (Analysis of Variance)*, dilanjutkan dengan uji Duncan dengan taraf kepercayaan 95%. Hasil yang diperoleh menunjukkan pemberian asam humat konsentrasi 20 mg/L melalui daun meningkatkan tinggi batang, jumlah daun, bobot tajuk secara signifikan dibanding kontrol. Pemberian asam humat konsentrasi 20mg/L melalui sistem perakaran secara signifikan meningkatkan jumlah daun, bobot tajuk dan akar serta menurunkan kadar oksalat. Selain itu, pemberian asam humat konsentrasi 20 mg/L melalui daun mampu meningkatkan kadar betasianin daun bayam merah. Dari penelitian ini dapat disimpulkan bahwa pemberian asam humat konsentrasi 20 mg/L melalui daun dan sistem perakaran mampu meningkatkan pertumbuhan, hasil dan kadar betasianin, serta menurunkan kadar oksalat pada bayam merah.

Kata kunci: Asam Humat, Biostimulan, Bayam merah (*Amaranthus tricolor* L.), Pertumbuhan, Hasil, Oksalat, Betasianin.

THE EFFECT OF HUMIC ACID ON VEGETATIVE GROWTH, YIELD, OXALIC ACID AND BETACYANIN CONTENT OF RED AMARANTH (*Amaranthus tricolor* L.)

Fitri Lestari

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ABSTRACT

Humic acid is biostimulan that has a negative charge and it is able to bind cations that are important in the process of plant growth. Red amaranth (*Amaranthus tricolor* L.) contains nutrients such as betasianin which is a reddish purple pigment dissolved in water and it has a function as an antioxidant, but it also anti-nutrient such as oxalate which is inhibits calcium absorption in the body. This study was aimed to evaluated the effect of humic acid on vegetative growth, productivity, oxalic acid content, and betacyanin content of red amaranth (*Amaranthus tricolor* L.). Red amaranth seeds were germinated in polybag containing top soil as growth media. Humic acid were applied when plants were at 2 weeks old with concentration variation of 0 mg/L, 5 mg/L, 20 mg/L or 35 mg/L through leaf or root system. Vegetative growth observed was stem height and leaf number, yield observed was fresh and dry weight of canopy and root. Oxalic acid content was determined by permanganometric titration, and density of the Ca-oxalate crystal was observed using free-hand section technique. Betacyanin content was determined using HPLC (*High Performance Liquid Chromatography*), and chlorophyll content was determined by spectrophometric method. Data were analyzed by *One Way ANOVA (Analysis of Variance)*, followed by Duncan with 95% confidence level. Results showed that, humic acid of 20 mg/L applied through the leaves significantly increase plant height, number of leaves, the fresh and dry weight of the canopy. Humic acid of 20 mg/L that was applied through the root system significantly increased the number of leaves, canopy and root weights and reduced oxalate content. In addition, humic acid of 20 mg / L applied through leaves increased betacyanin content of red amaranth. From this study it can be concluded that humic acid of 20 mg/L applied through leaves or root system can increase growth, yield, betacyanin content, and reduce oxalate content of red amaranth.

Keywords: Humic Acid, Biostimulant, Red amaranth (*Amaranthus tricolor* L.), Vegative growth, Yield, Oxalate, Betacyanin