Respon Fisiologis dan Anatomis Akar Tanaman Bayam (*Amaranthus tricolor* L.) terhadap Cekaman NaCl

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INTISARI

Kadar salinitas tinggi menjadi permasalahan utama lahan marginal. NaCl merupakan jenis garam yang paling banyak terkandung pada tanah salin. Adanya kandungan garam yang tinggi dapat berdampak negatif pada pertumbuhan tanaman. Tujuan dari penelitian ini untuk mengetahui pengaruh cekaman NaCl terhadap pertumbuhan dan anatomi akar tanaman bayam serta mengetahui konsentrasi NaCl yang dapat menghambat pertumbuhan tanaman bayam. Pada penelitian ini digunakan perlakuan NaCl dengan 5 variasi konsentrasi yaitu 0, 200, 400, 600 dan 800 mM. Parameter yang diukur meliputi tinggi tanaman, jumlah daun, warna daun, panjang akar, jumlah akar, berat basah, berat kering, kadar klorofil, tebal epidermis akar, tebal korteks akar dan diameter stele akar. Data dianalisis dengan uji ANOVA dilanjutkan dengan DMRT taraf kepercayaan 95% menggunakan program SPSS 15. Hasil yang diperoleh menunjukkan penambahan NaCl menyebabkan penurunan tinggi tanaman, jumlah daun, kadar klorofil dan rasio tajuk dibanding akar. Konsentrasi NaCl 600 dan 800 mM memberikan hasil penurunan yang signifikan terhadap tinggi tanaman, jumlah daun, berat basah total, berat kering total, rasio tajuk dibanding akar dan kadar klorofil. Selain, itu. Penambahan NaCl menyebabkan penurunan kerapatan xilem dan floem akar.

Kata Kunci: *Amaranthus tricolor*, NaCl, Pertumbuhan Tanaman, Akar

Physiological and Root Anatomical Responses of Spinach (*Amaranthus tricolor* L.) to NaCl Stress

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ABSTRACT

High level of salinity is a major problem to the marginal land. NaCl is the mostly found type of salts contained in the saline land. The high concentration of salt can bring negative effects to plant growth. The aim of this research was to know the effect of NaCl stress on the root growth and anatomy of spinach (*Amaranthus tricolor* L.) as to know the concentration of NaCl that may inhibit the spinach growth. This research involved various concentrations of NaCl i.e. 0, 200, 400, 600, 800 mM. The parameters measured included plant height, fresh weight, dry weight, leaf number, leaf color, and chlorophyll concentration of the leaves, epidermis thickness, cortex thickness, and stele diameter of the roots. Data were analyzed by ANOVA test and followed by DMRT with confidence level of 95% using SPSS Program vers. 15. The results showed that the addition of NaCl caused a decrease in plant height, leaf number, chlorophyll concentration, and shoot to root ratio. NaCl concentration of 600 and 800 mM gave the results with a significant decrease on plant height, leaf number, total fresh weight, total dry weight, root to shoot ratio, and chlorophyll concentration. Besides that, NaCl addition caused a decrease in the density of root xylem and phloem.

Keywords: *Amaranthus tricolor*, NaCl, Plant growth, Root