

RINGKASAN

Aktivitas sektor industri di Indonesia meningkatkan pertumbuhan ekonomi bagi masyarakat dan menjadi salah satu unsur penting dalam pembangunan di Indonesia. Disisi lain, adanya kegiatan industri tersebut dapat menghasilkan limbah industri yaitu logam berat yang dapat mencemari air, udara, tanah dan persawahan. Salah satu jenis logam berat yang dapat mempengaruhi perkembangan dan pertumbuhan tanaman adalah kadmium (CdSO_4). Tomat yang terkena cekaman kadmium tentunya akan mengalami dampak atau kerusakan pada tanaman sehingga mempengaruhi tingkat produktivitas dan penurunan pertumbuhan tanaman tomat. Oleh karena itu, penelitian ini bertujuan untuk mengkaji bagaimana karakter anatomi dan respon fisiologis pada tanaman tomat (*Solanum lycopersicum* L. var. *gammara*) yang terkena cekaman kadmium.

Metode yang digunakan dalam penelitian ini adalah metode eksperimental Rancangan Acak Lengkap (RAL) dengan variabel bebas berupa empat taraf konsentrasi kadmium yaitu 0; 25; 50 dan 100 ppm masing-masing perlakuan diulang sebanyak 5 kali. Metode pembuatan preparat anatomi menggunakan metode parafin (*embedding*). Parameter yang diamati adalah tebal kutikula, epidermis, mesofil, ukuran stomata (panjang dan lebar), jumlah stomata per mm^2 luas daun serta tinggi tanaman dan kandungan klorofil. Data hasil pengamatan dianalisis menggunakan Analisis Ragam (Anova), atau Uji F dengan tingkat kesalahan 5% dan 1%, dilanjutkan dengan uji lanjut BNT dengan taraf signifikan 5%.

Hasil penelitian menunjukkan bahwa Tanaman tomat (*Solanum lycopersicum* L. var. *gammara*) yang tercekam kadmium (CdSO_4) mengalami perubahan karakter anatomi daun dan respon fisiologis dan konsentrasi kadmium 25 ppm dapat ditoleransi pada tanaman tomat.

Kata Kunci: *kadmium, karakter anatomi daun, karakter fisiologis daun, tomat*

SUMMARY

Industrial sector activities in Indonesia are known as pillars to increase economic growth for society and has become an important element of development in Indonesia. On the other side, these industrial activities also produce industrial waste, such as heavy metals, which can pollute water, air, soil, and rice fields. One type of heavy metal that can affect plant development and growth is cadmium (CdSO₄). Tomatoes that are exposed to cadmium stress will certainly experience impacts or damage to the plant, thereby affecting the level of productivity and decreasing the growth of tomato plants. Therefore, this research aims to examine the anatomical characteristics and physiological responses of tomatoes (*Solanum lycopersicum* L. var. *gammara*) that were exposed to cadmium stress.

A Completely Randomized Design (CRD) experimental method was used with independent variables in the form of four levels of cadmium concentration, namely 0; 25; 50 and 100 ppm, with each treatment being repeated five times. The method that is used for making anatomical preparations is the paraffin (embedding) method. The parameters that were observed are cuticle thickness, epidermis, mesophyll, stomata size (length and width), number of stomata per mm² of leaf area, as well as plant height and chlorophyll content. Observation data were analyzed using Analysis of Variance (Anova), or F test with 5% and 1% error rate, followed by BNT further test with 5% significant level.

The results showed that tomato plants (*Solanum lycopersicum* L. var. *gammara*) affected by cadmium (CdSO₄) experienced changes in leaf anatomical characters and physiological responses and cadmium concentration of 25 ppm can be tolerated in tomato plants.

Keywords: *cadmium, leaf anatomy characters, leaf physiological characters, tomato*

