PENGARUH PEMBERIAN Cu TERHADAP PERTUMBUHAN, AKUMULASI, AKTIVITAS *SUPEROXIDE DISMUTASE* (*SOD*) DAN KANDUNGAN TOTAL FENOL DAUN TANAMAN PADI (*Oryza sativa* L.'CEMPO MERAH')

INTISARI

Cu merupakan mikronutrien esensial yang dibutuhkan bagi pertumbuhan tanaman padi. Aktivitas antropogenik telah menyebabkan peningkatan konsentrasi Cu dalam tanah. Konsentrasi Cu dalam jumlah berlebih pada tanah dapat menyebabkan efek toksik dan memicu stres oksidatif bagi tanaman padi. Respon antioksidatif tanaman dalam menghadapi stres oksidatif biasanya ditunjukkan dengan mekanisme pertahanan oksidatif berupa aktivitas enzim oksidatif dan produksi senyawa fenolik. Penelitian ini bertujuan untuk mengetahui pengaruh pemberian Cu terhadap pertumbuhan, akumulasi, dan aktivitas *superoxide dismutase* (*SOD*) tanaman padi (*Oryza sativa* L. 'Cempo Merah'). Selain itu untuk mengetahui pengaruh pemberian Cu terhadap kandungan total fenol daun tanaman padi (*Oryza sativa* L. 'Cempo Merah'). Perlakuan pemberian konsentrasi Cu yang diberikan pada penelitian ini yaitu 0 ppm, 100 ppm, dan 300 ppm yang disiramkan pada saat tanaman berusia 28 HST. Pengujian sampel dilakukan pada interval waktu 0, 4, 72, 168 jam setelah aplikasi Cu. Pengujian akumulasi Cu dilakukan pada sampel tanah dan daun dengan menggunakan ASS-nyala api. Pengujian aktivitas *superoxide dismutase* (*SOD*) diuji berdasar metode Giannopolitis & Ries (1976) dan kandungan total fenol diuji dengan metode Folin-Ciocalteau menggunakan spektrofotometer. Parameter yang diamati meliputi tinggi tanaman, jumlah daun, jumlah anakan, berat basah, berat kering, konsentrasi Cu dalam tanah dan daun tanaman padi, pH tanah, aktivitas SOD, dan kandungan total fenol daun padi. Hasil penelitian menunjukkan bahwa peningkatan konsentrasi Cu yang diberikan dalam air siraman dapat meningkatkan : akumulasi Cu dalam tanah dan daun padi, aktivitas SOD, dan kandungan total fenol daun padi (*Oryza sativa* L. 'Cempo Merah') tetapi pertumbuhan tanaman terhambat seiring peingkatan konsentrasi Cu yang diberikan. Aktivitas SOD daun (*Oryza sativa* L. 'Cempo Merah') tertinggi terjadi pada perlakuan Cu 300 ppm yaitu sebesar 7,83 unit/g daun. Kandungan total fenol daun (*Oryza sativa* L. 'Cempo Merah') terjadi pada perlakuan Cu 300 ppm yaitu sebesar 223,52 mg GAE/g ekstrak.

Kata kunci : Cu, padi, 'Cempo Merah', *superoxide dismutase* (*SOD*), total fenol

EFFECTS OF Cu ON PLANT GROWTH, ACCUMULATION, *SUPEROXIDE DISMUTASE* (*SOD*) ACTIVITY AND TOTAL PHENOLIC COMPOUNDS OF PADDY (*Oryza sativa* L. 'CEMPO MERAH') LEAVES

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ABSTRACT

Copper is one of the essential micronutrients for growth of paddy plant. Anthropogenic acvities have increased copper concentration in the soils. High concentration of copper in the soils could cause toxic effects and oxidative stress to paddy plant. In order to overcome from this oxidative stress, plants have several anti-oxidative responses such as enhancing the the activity of anti-oxidative enzymes and producing antioxidant compounds. This research aims to study the effects of Cu treated water on plant growth, accumulation, *superoxide dismutase* (*SOD*) activity and total phenolic compounds concentration of paddy (*Oryza sativa* L. 'Cempo Merah'). Copper with concentrations 0 ppm, 100 ppm, and 300 ppm was added to the plants 28 days post-cultivated. Then, the samples of soils and leaves were collected 4 times, i.e. 0, 4, 72, and 168 hours post-Cu treated. The accumulation of Cu in the soils and paddy leaves was analyzed by using flame-AAS. The *superoxide dismutase* (*SOD*) activity was analyzed by using Giannopolitis & Ries (1976) method and total phenolic compounds was analyzed by using *Folin-Ciocalteau* method using spectrophotometer. The variables being observed were the number of copper concentration in the soil and the paddy leaves post-treated, the plants' height, the number of leaves, the number of tillers, the plants' fresh weight, the plants' dry weight, the pH of the soil, the SOD activity, and the total phenolic compounds concentration of paddy. The result showed that adding the number of Cu^{2+} concentration in the water could increase the number of copper concentration in the soil and the paddy leaves, and could also increase the SOD activity and the total phenolic compounds concentration of paddy (*Oryza sativa* L.) 'Cempo Merah' leaves. The highest SOD activity in the (*Oryza sativa* L.) 'Cempo Merah' paddy leaves was at the 300 ppm Cu^{2+} treatment, i.e. 7,83 unit/g of paddy leaves. The total phenolic compounds concentration of paddy (*Oryza sativa* L.) 'Cempo Merah' leaves was also found at the 300 ppm Cu^{2+} treatment, i.e. 223,52 mg GAE/g of extracts.

Keywords : Cu, paddy, 'Cempo Merah', *superoxide dismutase* (*SOD*), total phenolic compounds