

Karakteristik eichhornia crassipes mart solms dan pistia stratiotes L pada air limbah domestik ipal bojongsong bandung serta uji toksisitas hasil fitoremediasinya = characteristic of eichhornia crassipes mart solms and pistia stratiotes l in domestic wastewater in wastewater treatment plant bojongsong bandung and toxicity test results of their phytoremediation / Tony Sudjarwo

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Abstrak

[ABSTRAK

Penelitian telah dilakukan mengenai karakteristik Eichhornia crassipes (Mart.) Solms dan Pistia stratiotes L. pada air limbah domestik serta uji toksisitas hasil fitoremediasinya. Penelitian bertujuan untuk mengetahui aspek anatomi, fisiologi dan ekologi E. crassipes dan P. stratiotes serta toksisitas hasil fitoremediasinya terhadap Dahnia magna L. dan Cyprinus carpio L. Bahan ditempatkan di outlet kolam anaerob, fakultatif dan maturasi di Instalasi Pengolahan Air Limbah (IPAL) Bojongsong Bandung selama 14 hari dan sebagai fitoremediator selama 10 hari dengan metode statik. Hasil fitoremediasi diuji toksisitas akut dan sub akut terhadap D. magna selama 2 hari dan C. carpio selama 4 hari. Hasil penelitian menunjukkan E. crassipes dan P. stratiotes sebagian besar menurun pada diameter akar 1,18-2,50 mm, stele 0,37-1,82 mm, korteks 0,30-0,65 mm, panjang akar 0,05-5,21 cm dan kadar klorofil 0,19-1250,33 mg/L, serta meningkat pada berat basah 93,39-99,49 g, panjang stolon 11,33-15,97 cm, panjang petiola 2,05-3,21 cm dan luas daun 1,12-8,56 cm²; kelimpahan bakteri nitrifikasi pengoksidasi amonia (AOB) dan bakteri pengoksidasi nitrat (NOB) meningkat pada rhizosfer E. crassipes. Efisiensi tertinggi E. crassipes 86,14% fosfat dan 98,41% nitrat dengan retensi terendah 0,3-0,4 hari, serta tertinggi P. stratiotes 96,34% TSS, 97,20% kekeruhan dan 96,70% BOD. Kadar nitrat di akar lebih tinggi dibanding pada daun. Hasil fitoremediasi menunjukkan toksik rendah, meningkatkan rata-rata telur 12,1-14,7, frekuensi bertelur 0,7 dan awal hari bertelur 3,5-3,6 hari, serta peningkatan laju konsumsi oksigen 150,8-239,1 mg/g bb/jam C. carpio pada hasil fitoremediasi E. crassipes. Hasil-hasil tertinggi sebagian besar diperoleh pada air limbah domestik dari kolam anaerob dan fakultatif. Eichhornia crassipes dan Pistia stratiotes adaptif pada air limbah domestik, berpotensi tinggi dalam menurunkan polutan air limbah domestik dengan hasil fitoremediasinya toksik rendah.;

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ABSTRACT

Research has been done on the characteristics of Eichhornia crassipes

(Mart.) Solms and Pistia stratiotes L. in domestic wastewater and phytoremediation results toxicity test. The study aims to determine anatomy, physiology and ecology aspect, and the toxicity test of phytoremediation results against Daphnia magna L. and Cyprinus carpio L. Materials placed on the outlet in anaerobic, facultative and maturation ponds on Wastewater Treatment Plant (WWTP) Bojongsoang Bandung for 14 days, and as phytoremediator for 10 days using static methods. Acute toxicity tests and sub acute phytoremediation results for D. magna reproduction for 2 days and the rate of oxygen consumption C. carpio for 4 days. The results showed in E. crassipes and P. stratiotes most of the decrease in root diameter 1.18-2.50 mm, stele 0.37-1.82 mm, cortex 0.30-0.65 mm, root length 0.05-5.21 cm and chlorophyll content 0.19-1250.33 mg/L, and the increase in wet weight 93.39-99.49 g, stolon length 11.33-15.97 cm, petiole length 2.05-3.21 cm and leaf area 1.12-8.56 cm²; abundance of nitrifying ammonia oxidizing bacteria (AOB) and nitrate oxidizing bacteria (NOB) is increased in the rhizosphere of E. crassipes. The highest efficiency of E. crassipes 86.14% phosphate and 98.41% nitrate, and P. stratiotes 96.34% TSS, 97.20% turbidity and 96.70% BOD, and the lowest retention of 0.3-0.4 days. Nitrate levels in roots was higher than in the leaves. Domestic wastewater toxicity test phytoremediation results to D. magna and C. carpio showed low toxic. Subacute toxicity tests on D. magna reproduction showed increase the average egg 2.1-14.7, the frequency spawn about 0.7 and earlier in the day spawn 3.5-3.6 days, and increase in the rate of oxygen consumption 150.8-239.1 mg/g w/h C. carpio on E. crassipes phytoremediation results. The results mostly takes place in the wastewater from the anaerob and facultative ponds. Eichhornia crassipes and Pistia stratiotes adaptive in domestic wastewater, high potential in reducing, Research has been done on the characteristics of Eichhornia crassipes

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