ABSTRAK

APLIKASI *CONSTRUCTED WETLAND* SISTEM *SUB-SURFACE FLOW* DALAM PENYISIHAN KADAR PENCEMAR LIMBAH CAIR BATIK

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IX + 124 Halaman + 23 Tabel + 21 Gambar + Lampiran

ABSTRAK

Limbah cair batik mengandung logam berat, lilin dan memiliki pH, zat warna, *Biological oxygen demand* (BOD_5), *total suspended solids* (TSS) dan *chemical oxygen demand* (COD) yang tinggi, kontaminan yang terkandung dalam air limbah biasanya sangat berbahaya bagi lingkungan apabila dibuang secara langsung. Salah satu teknologi untuk pengolahan limbah cair batik adalah *consctructed wetland*. Pengolahan limbah cair batik pada penelitian ini menggunakan *consctructed wetland* sistem aliran bawah permukaan *(Sub-Surface Flow Constructed Wetland)* dengan *biochar* lumpur limbah dan tanpa *biochar* menggunakan tanaman pandan wangi *(Pandanus amaryllifolius).* Penelitian ini bertujuan untuk mengetahui pengaruh *construction wetland* tanpa biochar dan menggunakan *biochar* terhadap penyisihan pH, Warna, TSS, BOD_5 dan COD limbah cair batik. Pada pengolahan dengan *consctructed wetland*. Konsentrasi parameter awal limbah cair batik yaitu pH 9, Warna 1983,84 Pt.Co, BOD_5 2466,84 Mg/l, COD 7795,73Mg/l dan TSS 1590,00 Mg/l. Pada penelitian menggunakan variasi *biochar* 10% dengan waktu tinggal 3 hari memiliki tingkat penyisihan lebih tinggi jika dibandingkan dengan waktu tinggal 5 dan7 hari, dan juga variasi *biochar* 20% dengan waktu tinggal 3 hari, 5 hari dan 7 hari, Tingkat penyisihan paling efektif dihasilkan pada *consctructed wetland* dengan *biochar* 0% waktu tinggal 3 hari dengan nilai persentase pH 22,22%, nilai persentase warna 95,57%, di hari ke 5 nilai persentase BOD_5 97,76%, nilai persentase COD 97,29% dan TSS nilai persentase 98,38%.

Kata kunci : *consctructed wetland, biochar, limbah cair batik, pandan wangi, pH, Warna, BOD_5, COD, TSS*

ABSTRACT

Batik wastewater contains heavy metals, waxes and has a high pH, substance, biological oxygen demand (BOD5), total suspended solids (TSS) and chemical oxygen demand (COD), contaminants contained in wastewater are usually very harmful to the environment if disposed of directly. One of the technologies for treating batik wastewater is consctructed wetland. Batik wastewater treatment in this study uses a sub-surface flow constructed wetland system with sewage sludge biochar and without biochar using fragrant pandanus plants (Pandanus amaryllifolius). This study aims to determine the effect of construction wetland using biochar on the removal of pH, Color, TSS, BOD5 and COD of batik liquid waste. In processing with consctructed wetland. The initial parameter concentration of batik liquid waste is pH 9, Color 1983.84 Pt.Co, BOD5 2466.84 Mg/l, COD 7795.73Mg/l and TSS 1590.00 Mg/l. In the study using a 10% biochar variation with a residence time of 3 days had a higher removal rate when compared to residence times of 5 and 7 days, and also a 20% biochar variation with residence times of 3 days, 5 days and 7 days, the most effective removal rate was produced in consctructed wetland with 0% biochar residence time of 3 days with a pH percentage value of 22.22%, color percentage value of 95.57%, on day 5 the percentage value of BOD5 97.76%, COD percentage value 97.29% and TSS percentage value 98.38%.

Keywords: *consctructed wetland, biochar, batik wastewater, fragrant pandanus, pH, Color, BOD5, COD, TSS.*