

INTISARI

Kelestarian ekosistem (abiotik dan biotik) sungai perlu dilindungi kesehatannya dengan diukur kualitas airnya. Pengukuran umumnya menggunakan indikator fisik kimia sesuai baku mutu peruntukannya (air minum, pertanian, dll). Uji toksisitas adalah metode untuk menentukan dampak toksisitas terhadap ekosistem air, salah satunya yaitu Uji Toksisitas AODs (*Aquatic Organism environmental Diagnostic, Saraswati*). Penelitian bertujuan mengkaji kesehatan sungai dan mencari hubungan metode Uji Toksisitas AODs dengan parameter kualitas air sungai individual maupun keseluruhan, menggunakan Indeks Kualitas Air (Metode PI dan CCME-WQI). Metode Uji Toksisitas AODs terdiri dua tahap yaitu pembuatan larutan sampel (pemekatan/*freezing*, pengenceran/*diluting*) dan *Bioassay* menggunakan bioindikator ikan Mas (*Cyprinus Carpio Lin*), udang Galah (*Macrobrachium Rosenbergii deMan*) untuk mencari nilai 48h-LC₅₀. Pengambilan sampel air dilakukan di hulu, tengah, dan hilir. IKA sungai dihitung menggunakan tolak ukur konservasi sungai, nilai batas baik kualitas air sungai menggunakan pendekatan yang sama dengan sungai Gajah Wong yaitu nilai 48h-LC₅₀ AODs 620% sesuai penelitian Saraswati 2015, serta menggunakan data kualitas air sungai dari BLH DIY. Hasil penelitian Uji Toksisitas AODs menunjukkan kualitas air sungai Winongo dan Code bagian hulu, tengah, hilir masuk kategori tercemar (48h-LC₅₀ AODs < 620%). Sungai Gajahwong hulu kategori tercemar (48h-LC₅₀ AODs_{ikan} < 620%) dan tidak tercemar (48h-LC₅₀ AODs_{udang} 620%). Nilai 48h-LC₅₀ AODs berkaitan erat dengan nilai EC ditunjukkan dengan nilai R² sungai Winongo, Code dan Gajah Wong berturut-turut adalah 0,511;0,666 dan 0,5 (R² 0,5). Nilai regresi hubungan kesesuaian metode AODs dan PI sungai Winongo, Code dan Gajahwong adalah 0,4;0,5 dan 0,2. Nilai regresi hubungan kesesuaian metode AODs dan CCME-WQI sungai Winongo, Code dan Gajahwong adalah 0,4;0,54 dan 0,2. Kesimpulannya, hubungan kesesuaian antara metode AODs dengan PI dan CCME-WQI belum memiliki hubungan kuat.

Kata Kunci : Uji Toksisitas, Metode AODs, EC, PI,CCME-WQI

ABSTRACT

Ecosystem (abiotic and biotic) sustainability of the river needs to be protected by measuring its water quality. Generally, the measurement of river water quality is conducted with physical chemical indicator according to its usage standard (drinking water, agriculture, etc.). Toxicity test is a method to determine the toxicity impact on aquatic ecosystems, one of which is toxicity test of AODs (Aquatic Organism Environmental Diagnostic, Saraswati). This research aims to study and identify the health level of water quality with AODs toxicity test method with the other parameter of river water quality individually or a whole, using Water Quality Index (Method of PI and CCME-WQI). The toxicity test method of AODs consists of two stages, i.e. preparation of sample solution (freezing, diluting) and bioassay using Gold fish as the bio-indicator (Cyprinus Carpio Lin), Galah prawn (Macrobrachium Rosenbergii de Man) to have 48h-LC₅₀ value. Water sampling was conducted in upstream, midstream, and downstream area. The river Water Quality Index was calculated with river conservation standard, the standard value of the river water quality using the same method in Gajah Wong river, which has the value of AODs 48h-LC₅₀ = 620 % according to the research of Saraswati in 2015, and with the river water quality data from BLH DIY. The research result of AODs toxicity test shows that the water quality of Winongo and Code river in upstream, midstream, and downstream is categorized as polluted (48h-LC₅₀ AODs < 620 %). The upstream area of Gajah Wong river is categorized as polluted (48h-LC₅₀ AODs_{fish} < 620 %) and non polluted (48h-LC₅₀ AODs_{prawn} = 620 %). The value of 48h-LC₅₀ AODs is closely related to EC value which was shown by the R² values of Winongo, Code and Gajah Wong rivers, i.e. 0.511, 0.611 and 0.5 (R² = 0.5), respectively. The R² values for conformity relationship of AODs and PI methods of Winongo, Code and Gajah Wong rivers were 0.4, 0.5 and 0.2. The R²conformity values of AODs and CCME-WQI methods of Winongo, Code and Gajah Wong rivers were 0.4, 0.54 and 0.2. In conclusion, the conformity relationship between AODs method with PI and CCME-WQI has not had a strong relationship.

Keywords : Toxicity test, AODs method, EC, PI, CCME-WQI