

Mikoremediasi air limbah Sungai Sentiong, Kemayoran, Jakarta Pusat menggunakan isolat fungi pelapuk putih (InaCC F109, InaCC F126, InaCC F200, IN002 dan IN004) = Mycoremediation of Sentiong River wastewater, Kemayoran, Central Jakarta using white rot fungi isolates (InaCC F109, InaCC F126, InaCC F200, IN002 and IN004)

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Abstrak

Sungai Sentiong adalah salah satu sungai di Indonesia yang telah tercemar oleh berbagai jenis senyawa organik bandel yang terakumulasi dari rumah tangga dan industri skala kecil limbah. Tujuan dari penelitian ini adalah untuk mengetahui kemampuan lima isolat jamur busuk putih dari Koleksi Budaya Indonesia (*Pleurotus ostreatus* InaCC F109, *Agaricus campestris* InaCC F126, *Trametes versicolor* InaCC F200, IN002 dan *Pycnoporus sanguineus* IN004) dalam degradasi senyawa organik bandel di Sentiong air limbah sungai. Penapisan isolat jamur dilakukan untuk mendapatkan yang terbaik isolat jamur ligninolitik pada media lignin minimal (MM-L), ftalat minimal medium (MM-F) dan media Potato Dextrose Agar dilengkapi dengan guaiacol. Metode uji kompatibilitas dilakukan secara *in vitro* pada PDA. Tes mikoremediasi adalah dilakukan dengan dua perawatan; isolat ligninolitik terbaik dan konsorsium lima isolat jamur. Kemampuan jamur dalam mikoremediasi air limbah didasarkan pada parameter; total karbon (TC), aktivitas enzim ligninolitik (lignin peroksidase, manganese peroksidase dan laccase), dan melimpahnya senyawa bandel analisis Kromatografi Gas Mass Spectrometry (GCMS). Hasil penyaringan menunjukkan bahwa *Pycnoporus sanguineus* IN004 memiliki kemampuan ligninolitik terbaik dibandingkan dengan empat isolat lainnya. Interaksi antarspesies yang kompatibel sebagian, penghambatan (dengan dan tanpa jarak) dan invasi (tahap awal) diketahui berdasarkan uji kompatibilitas. Konsorsium jamur memiliki kemampuan untuk degradasi senyawa organik bandel melalui proses metabolisme yang lebih baik daripada *Pycnoporus sanguineus* IN004 monokultur. Penurunan kelimpahan senyawa organik bandel di sampel sesuai dengan penurunan konsentrasi TC dan peningkatan aktivitas enzim ligninolitik.

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Sentiong River is one of the rivers in Indonesia that has been polluted by various types of recalcitrant organic compounds that have accumulated from households and small scale industries waste. The purpose of this study was to determine the ability of five white rot fungus isolates from the Indonesian Cultural Collection (*Pleurotus ostreatus* InaCC F109, *Agaricus campestris* InaCC F126, *Trametes versicolor* InaCC F200, IN002 and *Pycnoporus sanguineus* IN004) in the degradation of recalcitrant organic compounds in Sentiong river wastewater. Screening of fungal isolates was carried out to get the best ligninolytic isolates on minimal lignin media (MM-L), minimal phthalates medium (MM-F) and Potato Dextrose agar to be equipped with guaiacol. The compatibility test method is done *in vitro* on a PDA. Mycoremediation test is carried out with two treatments; the best ligninolytic isolates and a consortium of five fungal isolates. The ability of mushrooms in mycoremediation of wastewater is based on parameters; total carbon (TC), ligninolytic enzyme activity (lignin peroxidase, manganese peroxidase and laccase), and an abundance of recalcitrant compounds of Gas Mass Spectrometry (GCMS) chromatography analysis. The screening results

showed that *Pycnoporus sanguineus* IN004 had the best ligninolytic ability compared to four other isolates. Partially compatible interactions between species, inhibition (with and without distance) and invasion (early stages) are known based on compatibility tests. The mushroom consortium has the ability to degrade recalcitrant organic compounds through a better metabolic process than *Pycnoporus sanguineus* IN004 monoculture. The decrease in the abundance of recalcitrant organic compounds in the sample corresponds to a decrease in TC concentration and an increase in ligninolytic enzyme activity.