INTISARI

Limbah plastik *Polyethylene Terephthalate* (PET) menjadi salah satu permasalahan bagi lingkungan karena belum bisa diatasi sepenuhnya. Kemiripan struktur kimia dan enzim pendegradasi antara plastik PET dengan asam tanat memberikan kemungkinan bahwa mikrobia pendegradasi asam tanat mampu mendegradasi palstik PET. Penelitian ini bertujuan untuk mendapatkan isolat mikrobia pendegradasi asam tanat dari sampel tanah dan kayu Hutan Wanagama UGM serta sampah TPA Piyungan, selanjutnya diuji kemampuannya dalam mendegradasi plastik PET. Parameter seleksi isolat berupa aktivitas degradasi asam tanat melalui metode pembacaan visual (*visual reading*), pertumbuhan sel, dan residu asam tanat melalui metode presipitasi protein. Hasil isolasi diperoleh 49 isolat mikrobia pendegradasi asam tanat. Isolat K12 diketahui sebagai isolat terpilih yang memiliki aktivitas degradasi asam tanat dan pertumbuhan sel paling tinggi, serta residu (sisa) asam tanat dalam medium yang lebih sedikit dibandingkan isolat lain. Identifikasi secara morfologi, biokimia dan analisis sekuen gen 16S rRNA menunjukkan bahwa isolat K12 merupakan bakteri *Pantoea dispersa*. Bakteri tersebut mampu mendegradasi asam tanat dan menggunakannya sebagai sumber karbon tunggal untuk pertumbuhan, namun ternyata belum mampu mendegradasi plastik PET dalam waktu inkubasi selama 30 hari.

Kata kunci : PET, asam tanat, bakteri pendegradasi, *Pantoea dispersa*.

ABSTRACT

Polyethylene Terephthalate (PET) plastics waste is one of the environmental problems because it has not been fully resolved. The similarity of the chemical structure and degrading enzymes between PET plastic and tannic acid gives the possibility that tannic acid-degrading microbes have the ability to degrade PET plastic. This study aimed to obtain tannic acid-degrading microbial isolates obtained from soil and wood samples from the Wanagama Forest UGM and Piyungan landfill, then tested for their ability to degrade PET plastic. The isolate selection parameters were tannic acid degradation activity through visual reading method, cell growth, and tannic acid residue through protein precipitation method. The isolation results obtained 49 isolates of tannic acid-degrading microbes. Isolate K12 known as a selected isolate which had the highest tannic acid degradation activity and cell growth, and less tannic acid residue in the medium than other isolates. Identification of morphological, biochemical and sequences analysis of the 16S rRNA gene showed that isolate K12 was *Pantoea dispersa*. These bacteria were able to degrade tannic acid and use it as a sole carbon source for growth, but it was not able to degrade PET plastic within 30 days of incubation.

Keywords: PET, tannic acid, degrading bacteria, *Pantoea dispersa*.