RINGKASAN

Sampah merupakan salah satu produk buangan dari aktivitas manusia. Jumlah penduduk yang terus meningkat maka meningkatkan produksi sampah, termasuk sampah organik. Penanganan sampah yang belum optimal menyebabkan berbagai masalah. Sampah organik secara alami akan didegradasi oleh mikroorganisme, namun proses degradasi secara alami ini terjadi secara lambat. Usaha untuk mempercepat laju degradasi sampah perlu dilakukan antara lain dengan menggunakan konsorsium mikroorganisme. Agen pendegradasi diformulasikan dalam suatu konsorsium untuk meningkatkan efektifitas kerjanya. Konsorsium akan disusun dari 4 isolat bakteri koleksi Laboratorium Mikrobiologi Fakultas Biologi Unsoed berkode LG73, LG101, LG113, dan SA127 yang telah diketahui kemampuan produksi amilase, protease, lipase, dan selulasenya. Isolat bakteri tersebut diisolasi dari lingkungan mangrove pantai Logending, Kebumen dan Segara Anakan, Cilacap. Tujuan penelitian ini yaitu mengetahui kemampuan konsorsium bakteri dalam mendegradasi sampah organik dan pengaruh konsentrasi inokulum konsorsium bakteri LG73, LG101, LG113, dan SA127 terhadap laju degradasi sampah organik.

Penelitian dilakukan dengan metode eksperimental menggunakan Rancangan Acak Lengkap (RAL), dengan perlakuan berupa variasi konsentrasi konsorsium yang diinokulasikan pada sampah, yaitu 1%, 5%, 10%, dan kontrol negatif. Masing-masing perlakuan dilakukan pengulangan sebanyak 3 kali. Parameter utama yang diukur adalah nilai rasio C/N kompos. Parameter pendukung yang diamati yakni suhu, warna, tekstur, bau, pH, dan kelimpahan mikroorganisme lipolitik, proteolitik, amilolitik, dan selulolitik. Data hasil penelitian dianalisis menggunakan ANOVA dengan tingkat kepercayaan 95% dan uji lanjut menggunakan uji Tuckey HSD.

Hasil penelitian menunjukkan bahwa pemberian inokulum konsorsium bakteri yang terdiri atas isolat LG73, LG101, LG113 dan SA127 mampu mendegradasi sampah organik. Pengaruh konsorsium bakteri terhadap hasil pengomposan dapat dilihat berdasarkan nilai rasio C/N. Nilai rasio C/N sampah organic awal adalah 1,09 – 5,83, setelah 28 hari nilai rasio C/N sampah organic adalah 2,67 – 7,34. Konsentrasi inokulum yang berbeda juga menunjukkan hasil pengomposan yang berbeda. Konsentrasi inoculum konsorsium bakteri 1% (P1) menghasilkan pengomposan yang lebih tinggi dengan rasio C/N 7,34.

Kata Kunci : *biodegradasi, C/N ratio, konsorsium bakteri, sampah organik.*

SUMMARY

Garbage is one of the waste products of human activity. The increasing population will increase waste production, including organic waste. Waste management that is not yet optimal causes various problems including environmental damage, sources of disease, unpleasant odors, aesthetic damage, and others. Organic waste will naturally be degraded by microorganisms, but this natural degradation process occurs slowly and is not proportional to the rate of accumulation of waste. Efforts to accelerate the rate of waste degradation need to be carried out, among others, by using a consortium of microorganisms. Degrading agents are formulated in a consortium to increase their effectiveness. The consortium is composed of four bacterial from the collection of the Unsoed Faculty of Biology Microbiology Laboratory coded LG73, LG101, LG113, and SA127 which have known production capabilities of amylase, protease, lipase, and cellulase. The bacterial isolates were isolated from the coastal mangrove environment of Logending and Segara Anakan. This study aimed to determine the ability of the bacterial consortium to degrade organic waste and the effect of inoculum concentration of bacterial consortium LG73, LG101, LG113, and SA127 on the rate of organic waste degradation.

The research was conducted using an experimental method using a completely randomized design (CRD). The treatments were variation of bacterial consortium concentrations inoculated into the waste (1%, 5%, 10%, and negative control). Each treatment was replicated three times. The main parameter measured was the C/N ratio of the compost. Supporting parameters observed were temperature, color, texture, odor, pH, and abundance of lipolytic, proteolytic, amylolytic, and cellulolytic bacteria. The research data were analyzed using ANOVA with a confidence level of 95% and further tested using Tukey's Honestly Significant Difference (HSD) test.

The results showed that the provision of bacterial consortium inoculum consisting of isolates LG73, LG101, LG113, and SA127 was able to degrade organic waste. The effect of bacterial consortium on composting results can be seen based on the C/N ratio value. The initial C/N ratio value for organic waste is 1.09 - 5.83, after 28 days the C/N ratio value for organic waste is 2.67 - 7.34. Different inoculum concentrations also showed different composting results. The inoculum concentration of 1% bacterial consortium (P1) produced higher composting with a C/N ratio of 7.34.

Keywords : *bacterial consortium, Biodegradation, C/N ratio, organic waste*