

## RINGKASAN

Pengomposan adalah salah satu metode untuk mengatasi limbah organik menjadi senyawa yang menyerupai humus (*humus like substance*) melalui proses aerobik dan melibatkan mikroba. Pemanfaatan konsorsium mikroba diharapkan dapat meningkatkan laju degradasi limbah organik, di antaranya jerami padi. Penerapan konsorsium mikroba pada proses pengomposan memerlukan medium pembawa. Pemanfaatan dedak padi sebagai alternatif media pembawa dinilai murah dan mudah diperoleh. Konsorsium mikroba tersusun dari isolat LG73, LG101, LG113, LG126, dan SA127 yang memiliki kemampuan enzimatik hidrolitik. Tujuan penelitian adalah mengetahui viabilitas dan aktivitas enzimatik konsorsium bakteri yang disimpan pada media pembawa dedak selama 28 hari dan kemampuannya mendegradasi jerami padi.

Percobaan dilakukan dalam dua tahap, yaitu uji penggunaan dedak sebagai media pembawa dan pengujian efektifitas degradasi jerami padi. Percobaan penggunaan dedak sebagai media pembawa menggunakan rancangan acak lengkap (RAL) untuk menguji viabilitas konsorsium bakteri yang disimpan pada dedak selama waktu inkubasi 7, 14, 21 dan 28 hari. Tahap percobaan pengujian efektifitas degradasi jerami padi menggunakan rancangan acak kelompok (RAK) untuk menguji kemampuan degradasi jerami padi oleh konsorsium bakteri pada lama pengomposan 7, 14, 21 dan 28 hari. Data yang diperoleh dianalisis menggunakan One Way ANOVA dan uji lanjut Tukey HSD.

Hasil penelitian menunjukkan viabilitas konsorsium bakteri pada dedak sampai dengan waktu inkubasi 28 hari masih tinggi yaitu 94,79%, dengan jumlah sel bakteri  $1,48 \cdot 10^8$  CFU/g serta memiliki kemampuan enzimatik dengan indeks hidrolitik 0,1141-0,3839 dari waktu inkubasi 7 sampai dengan 28 hari. Laju dekomposisi jerami padi menggunakan konsorsium bakteri dengan media dedak sebesar 0,022%/hari dengan penurunan massa terbaik terjadi pada waktu inkubasi 7 hari yaitu sebesar 62,96%.

Kata kunci : kemampuan enzimatik, konsorsium bakteri, media pembawa, pengomposan, viabilitas

## SUMMARY

Composting is one of the methods to manage organic waste and convert it into a humus-like substance through aerobic processes involving microorganisms. The utilization of microbial consortia is expected to enhance the degradation rate of organic waste, such as rice straw. The application of microbial consortia in the composting process requires a carrier medium. The utilization of rice bran as an alternative carrier medium is considered cost-effective and easily obtainable. This study utilized isolates LG73, LG101, LG113, LG126, and SA127, which possess hydrolytic enzymatic abilities. The objective of this research was to determine the viability of the bacterial consortium stored on rice bran carrier medium for 28 days and its ability to degrade rice straw.

The experiment was conducted in two stages, namely testing the use of rice bran as a carrier medium and testing the effectiveness of rice straw degradation. The use of rice bran as a carrier medium experiment employed a completely randomized design (CRD) to assess the viability and enzymatic ability of the bacterial consortium stored on rice bran during incubation periods of 7, 14, 21, and 28 days. The stage of testing the effectiveness of rice straw degradation utilized a randomized block design (RBD) to evaluate the ability of the bacterial consortium to degrade rice straw during composting periods of 7, 14, 21, and 28 days. The obtained data were analyzed using One-Way ANOVA and further analyzed using Tukey's HSD test.

The research results showed that the viability of the bacterial consortium on rice bran remained high until the 28-day incubation period, with a viability rate of 94,79% and a bacterial cell count of  $1,48.10^8$  CFU/g. The consortium also exhibited enzymatic capabilities with hydrolytic index values ranging from 0.1141 to 0.3839 during the 7 to 28-day incubation period. The decomposition rate of rice straw using the bacterial consortium with the best rice bran medium is 0.022% per day, with the highest decrease in mass occurring after a composting period of 7 days, amounting to 62.96%.

**Keywords** : bacterial consortium, carrier material, composting, enzymatic ability, viability