

**PENGUNAAN POLLARD GANDUM SEBAGAI KARIER
ENZIM SELULOLITIK DAN APLIKASINYA PADA
FERMENTASI JERAMI PADI**

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Intisari

Penelitian ini bertujuan untuk mengetahui pengaruh penggunaan pollard sebagai karier enzim selulolitik terhadap kualitas fermentasi jerami padi. Dalam penelitian ini dilakukan 6 macam perlakuan yaitu T₁(3%(v/w) aquades + 5%(v/w) aquades), T₂(3%(v/w) aquades+5%(v/w) bakteri asam laktat (BAL)RU 31), T₃(3%(w/w)enzim selulolitik aktif dengan karier pollard (ESK)+5%(v/w)BAL RU 31), T₄(3%(w/w)ESK inaktif+5%(v/w) BAL RU 31), T₅(3%(v/w)enzim selulolitik bebas aktif (ESB)+5%(v/w)BAL RU 31), dan T₆(3%(v/w)ESB inaktif+ 5%(v/w) BAL RU 31). Enzim diekstraksi dari cairan ketam sawah dan dilakukan penjeratan dengan metode adsorpsi fisik menggunakan pollard sebagai karier. Proses inaktivasi enzim dilakukan dengan perebusan pada suhu 80°C selama 30 menit. Penambahan BAL RU 31 dilakukan setelah jerami padi diperam secara aerobik dengan enzim selama 7 hari. Setelah ditambah inokulum BAL kemudian dilanjutkan pemeraman secara anaerobik selama 21 hari. Variabel yang diamati adalah aktivitas enzim *Carboxymethyl Cellulase* (CMC-ase), pH, kadar asam laktat, penurunan kadar bahan kering (BK), dan penurunan kadar serat kasar (SK) selama proses fermentasi. Data hasil pengamatan diuji statistik dengan analisis variansi menggunakan rancangan *Completely Random Design* (CRD) pola searah. Hasil analisis variansi menunjukkan adanya perbedaan akibat perlakuan maka dilanjutkan dengan uji *Duncan's new multiple range test* (DMRT). Aktivitas enzim yang digunakan sebagai aditif 5,278 ± 0,989 U/mg protein untuk ESK aktif, dan 7,135 ± 0,062 U/mg protein untuk ESB aktif. Penggunaan ESK dapat mencapai pH terbaik 5,173 dan kadar laktat tertinggi 3,458%BK. Penurunan kadar BK selama proses fermentasi pada jerami padi yang menggunakan aditif ESK secara kuantitatif lebih kecil dibandingkan dengan ESB, meskipun hasil analisis statistik menunjukkan tidak berbeda. Penurunan kadar SK yang dihasilkan ESK lebih rendah dibanding ESB, yaitu 8,953% dibanding 12,610%.

Kata Kunci: Enzim Selulolitik Karier, Pollard Gandum, Fermentasi Jerami Padi.

**USING WHEAT POLLARD AS CELLULOLYTIC ENZYME CARRIER
AND ITS APPLICATION OF RICE STRAW FERMENTATION**

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Abstract

The research was directed to find out the effect of using wheat pollard as carrier cellulolytic enzyme toward improving quality of rice straw fermentation. In this research, there was 6 (six) treatments : T₁(3%(v/w)of aquades + 5%(v/w) of aquades), T₂ (3%(v/w)of aquades + 5%(v/w)of Lactic acid bacteria RU 31 (LAB RU 31)), T₃ (3%(w/w)of active cellulolytic enzyme with carrier (CEC active) + 5%(v/w)of LAB RU 31), T₄(3%(w/w)of ECC inactive + 5%(v/w)of LAB RU 31), T₅(3%(v/w)of active free cellulolytic enzyme(FCE) + 5% (v/w)of LAB RU 31), T₆ (3%(v/w) of FCE inactive + 5%(v/w)of LAB RU 31). The enzyme was extracted from crabs and adsorbed using wheat pollard as a carrier (physical adsorption metode). The enzyme was inactivated by boiling at 80°C temperature for 30 minutes. The LAB RU 31 was added after incubation aerobic of rice straw for 7 day. Then rice straw was incubated anaerobic for 21 day. Variable of this study were analysed including Carboxymethyl Cellulase activity (CMC-ase), pH, lactic acid, decrease of dry matter (DM), decrease of crude fiber (CF). The result of this study was analyzed with one way Completely Random Design (CRD). There were any variable different was caused by treatments, they would be test using Duncan's multiple range test (DMRT). The CMC-ase activity has 5,278 + 0,989 U/mg protein for CEC active and 7,135 + 0,062 U/mg protein for FCE active. Using of CEC as an additive gave the best pH and lactic acid produce of fermented rice straw by 5,173 (pH) and 3,458%DM. Decreasing of DM of fermented rice straw with CEC active was lower than FCE active, but the result were non significant statistically. Decreasing of CF of fermented rice straw with CEC was Lower than FCE by 8,953% and 12,610%.

Key Words : Cellulolytic Enzyme Carrier, Wheat Pollard, Rice Straw Fermentation.