Perbandingan Aktivitas Antielastase Air Beras Merah (Oryza sativa L. var. Inpari 24) yang Difermentasi Spontan, dengan Ragi, dan Tidak Difermentasi = Comparison of Antielastase Activity of Spontaneously Fermented, Yeast-Fermented, and Unfermented Red Rice Water (Oryza sativa L. var. Inpari 24)

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Abstrak

Beras merah (Oryza sativa L. var. Inpari 24) mengandung polifenol dan oryzanol yang bermanfaat sebagai anti-aging. Fermentasi dapat meningkatkan kandungan fenolik dan flavonoid sehingga fermentasi air rendaman beras merah berpotensi meningkatkan aktivitas antielastase untuk pencegahan penuaan kulit. Mikroorganisme seperti bakteri pada hasil fermentasi dapat dikembangkan menjadi produk perawatan kulit karena diketahui dapat menangkal sinar ultraviolet. Penelitian ini bertujuan mengetahui perbandingan aktivitas antielastase pada air rendaman beras merah yang difermentasi secara spontan (FS), dengan ragi tapai (FR), dan tidak difermentasi (NF). Selain itu, untuk mengetahui bakteri apa yang dapat dipertimbangkan sebagai bahan dasar produk skincare. Metode ekstraksi dilakukan dengan perebusan beras merah dan UAE, fermentasi dilakukan secara spontan dan dengan penambahan ragi tapai. Identifikasi bakteri dilakukan dengan metode PCR. Setiap sampel ditetapkan kadar fenol dan flavonoid total, serta diuji aktivitas antielastasenya dengan mengukur absorbansi sampel. Hasil pengukuran persentase inhibisi enzim elastase sampel FS, FR, dan NF berturut-turut sebesar 66,20% (meningkat 18,36% dibanding NF); 71,79% (meningkat 28,35% dibanding NF); dan 55,93% dengan konsentrasi 150.000 ppm. Dari sampel FS dan FR dilakukan isolasi bakteri dan didapatkan lima isolat dari sampel FS dan dua isolat dari sampel FR. Hasil isolasi bakteri kemudian dilakukan PCR, dianalisis sekuensing, dan dianalisis dengan pohon filogenetik. Berdasarkan analisis filogenetik, isolat FS berkerabat dekat dengan Enterobacter sp., Pantoea agglomerans, Enterobacter mori dan Enterobacter hormaechei. Sementara itu, isolat FR berkerabat dekat dengan Enterobacter cloacae dan Enterobacter mori. Hasil penelitian ini menunjukkan bahwa fermentasi dapat meningkatkan aktivitas penghambatan terhadap enzim elastase secara signifikan yang mungkin terjadi akibat adanya Enterobacter dan Pantoea agglomerans selama fermentasi.

.....Red rice (Oryza sativa L. var. Inpari 24) contains polyphenolic compounds and oryzanol, which have anti-aging properties. Fermentation can increase phenolic and flavonoid content, thus fermentation of red rice water has the potential to enhance antielastase activity for skin aging prevention. Microorganisms such as bacteria in the fermentation product can be develop into skincare products due to their known ability to counteract ultraviolet rays. Therefore, this study aims to compare the antielastase activity of spontaneously fermented red rice water (FS), fermented with tapai yeast (FR), and unfermented (NF). Additionally, it aims to identify bacteria that could be considered as a base for skincare products. The extraction method involved boiling red rice and UAE, fermentation was carried out spontaneously and with the addition of tapai yeast. Bacterial identification was done using the PCR method. Each sample was then determined for total phenol and flavonoid content and tested for antielastase activity by measuring sample absorbance. The inhibition percentages of elastase enzyme for FS, FR, and NF samples were 66.20% (increased by 18,36% compared to NF); 71.79% (increased by 28,35% compared to NF); and 55.93% respectively, at a concentration of

150,000 ppm. From the FS and FR samples, bacterial isolation was conducted, yielding five isolates from the FS sample and two isolates from the FR sample. The bacterial isolates were then subjected to PCR, sequenced, and analyzed phylogenetically. Based on the phylogenetic analysis, FS isolates were kin to Enterobacter sp., Pantoea agglomerans, Enterobacter mori, and Enterobacter hormaechei. Meanwhile, FR isolates were kin to Enterobacter cloacae and Enterobacter mori. This study indicate that fermentation can significantly enhance elastase enzyme inhibition, possibly due to the presence of Enterobacter and Pantoea agglomerans during fermentation.