

AKTIVITAS ENZIM AMILASE DARI *Amylomyces rouxii* HASIL DOMESTIKASI *Rhizopus* spp. PADA PEMBUATAN RAGI TAPAI

Nabilah Amaliah

20/461066/BI/10617

Dosen Pembimbing : Dr. Miftahul Ilmi, S.Si., M.Si.

INTISARI

Ragi merupakan campuran mikroflora yang digunakan dalam pembuatan produk fermentasi. Proses pembuatan ragi menggunakan medium yang berbahan dasar pati. Proses sakarifikasi pati dapat dilakukan menggunakan mikrobia penghasil enzim amilase dan glukoamilase, salah satu nya adalah *Amylomyces rouxii*. Kapang ini memiliki karakteristik miselium yang mengandung banyak klamidospora, sporangia abortif, dan menyerupai *Rhizopus*. *A. rouxii* diduga merupakan hasil domestikasi dari *Rhizopus delemar*, *Rhizopus arrhizus*, dan *Rhizopus microsporus* yang berpotensi menghasilkan varian dengan kemampuan produksi enzim amilase yang tinggi. Penelitian ini bertujuan untuk mengetahui pengaruh siklus produksi ragi tapai dari grup *Rhizopus* terhadap aktivitas amilase serta mengetahui karakter enzim berdasarkan berat molekulnya selama proses domestikasi. Penelitian ini meliputi produksi ragi, seleksi dan isolasi kapang yang diduga *A. rouxii*, diikuti dengan produksi dan pengujian aktivitas enzim amilase, penentuan kadar protein, dan berat molekul protein. Data kuantitatif pengujian aktivitas enzim, kadar protein, dan aktivitas spesifik dianalisis menggunakan aplikasi SPSS *Repeated Measure* dengan nilai signifikansi <0.05 dan berat molekul protein dianalisis dengan aplikasi GelAnalyzer ver. 23.1.1. Hasil penelitian menunjukkan bahwa setelah 18 siklus produksi ragi yang dianalisis, *R. delemar* S10, *R. arrhizus* S15, dan *R. microsporus* S18 menunjukkan aktivitas enzim amilase tertinggi. Meskipun demikian, peningkatan aktivitas amilase yang tidak terlalu signifikan dibandingkan dengan isolat awal belum mengindikasikan terjadinya domestikasi *A. rouxii*. Namun, pengujian berat molekul menunjukkan *R. arrhizus* S10 dan *R. delemar* S18 memiliki kesamaan berat molekul protein amilase dengan *A. rouxii* yaitu sebesar 31 dan 59 kDa yang memungkinkan untuk terjadi mutasi.

Kata Kunci: Aktivitas enzim, Amilase, *Amylomyces rouxii*, Pati

**AMYLASE ENZYME ACTIVITY OF *Amylomyces rouxii* RESULTS
FROM THE DOMESTICATED OF *Rhizopus* spp. IN RAGI TAPAI
PRODUCTION**

Nabilah Amaliah

20/461066/BI/10617

Supervisor : Dr. Miftahul Ilmi, S.Si., M.Si.

ABSTRACT

Ragi is a mixture of microflora used in the making of fermented products. The ragi-making process uses a starch-based medium. The starch saccharification process can be carried out using microbes that produce amylase and glucoamylase enzymes, one of which is *Amylomyces rouxii*. This mold has the characteristics of mycelium containing many chlamydospores, abortive sporangia, and resembles *Rhizopus*. It is suspected that *A. rouxii* is the result of domestication from *Rhizopus delemar*, *Rhizopus arrhizus*, and *Rhizopus microsporus*, which have the potential to produce variants with high amylase enzyme production capabilities. This research aims to determine the effect of the ragi tapai production cycle from the *Rhizopus* group on amylase activity and to determine the enzyme character based on its molecular weight during the domestication process. This study included ragi production, selection and isolation of mold suspected of being *A. rouxii*, followed by production and testing of amylase enzyme activity, determination of protein content, and protein molecular weight. Quantitative data from enzyme activity, protein levels, and specific activity were analyzed using the SPSS *Repeated Measure* application with a significance value of <0.05 , and protein molecular weight was analyzed using the GelAnalyzer ver. 23.1.1 application. The results showed that after analyzed 18 cycles of ragi production, *R. delemar* S10, *R. arrhizus* S15, and *R. microsporus* S18 showed the highest amylase enzyme activity. However, the increased in amylase activity was not very significant compared to the initial isolates, which means this results did not indicate the domestication of *A. rouxii*. However, molecular weight testing showed that *R. arrhizus* S10 and *R. delemar* S18 had the same molecular weight of amylase protein as *A. rouxii*, namely 31 and 59 kDa, which allowed for mutations to occur.

Keywords: Enzyme activity, Amylase, *Amylomyces rouxii*, Starch