

## INTISARI

### ABSTRAK

Pengaruh Komposisi Bakterioma *Rhizopus oryzae* Terhadap Kandungan Asam Amino dan *Volatile Organic Compounds* Pada Tempe Kedelai

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Tempe merupakan makanan dari Indonesia berbahan dasar kedelai. Proses fermentasi tempe dibantu oleh jamur, salah satunya spesies *Rhizopus oryzae*. Proses fermentasi kedelai tidak terlepas dari interaksi jamur *Rhizopus oryzae* dengan bakteri. Interaksi ini memainkan aturan penting terhadap kondisi ekologis jamur. Penelitian ini bertujuan untuk mengetahui komposisi bakterioma *Rhizopus oryzae* dan pengaruh dari perubahan komposisi bakterioma *Rhizopus oryzae* terhadap kandungan asam amino dan *volatile organic compounds* pada tempe kedelai. Komposisi bakterioma dianalisis menggunakan QIIME2 Next Generation Sequencing (NGS), kandungan asam amino diuji dengan HPLC 16 standar, sedangkan kandungan *Volatil Organic Compounds* (VOC) diuji menggunakan GCMS secara *untargeted*. Hasil penelitian menunjukkan bahwa aplikasi antibiotik dapat merubah komposisi bakterioma *Rhizopus oryzae*. Aplikasi antibakteri ampicilin terbukti dapat merubah komposisi bakteri dari isolat kontrol yang didominasi oleh *others* (98%) menjadi dominan Proteobacteria (99,9%), dan antibakteri kloramfenikol mampu mengurangi dominansi *others* menjadi 76% dan memunculkan filum Proteobacteria (24%). Perlakuan kloramfenikol menghasilkan kandungan asam amino paling tinggi. Namun, pada analisis VOC perlakuan ampicilin memiliki VOC yang paling beragam daripada kontrol dan kloramfenikol. Hasil tersebut membuktikan bahwa perubahan komposisi bakterioma pada *Rhizopus oryzae* berpengaruh pada kandungan asam amino dan VOC pada tempe kedelai.

Kata Kunci: Bakterioma; Interaksi; *Rhizopus oryzae*; Tempe.

## ABSTRACT

### The Effect of Bacterioma Composition *Rhizopus oryzae* on Amino Acid Content and Volatile organic compounds in Soybean Tempeh

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*Tempeh is food from Indonesia made from soybeans. The fermentation process of tempeh is assisted by fungi, one of which the species is Rhizopus oryzae. The fermentation process of soybeans is inseparable from the interaction Rhizopus oryzae with bacteria. This interaction plays an important rule against the ecological conditions of fungi. This study aims to determine the bacterioma composition of Rhizopus oryzae and the effect of it changes on the content of amino acids and volatile organic compounds in soybean tempeh. Bacterioma composition was analyzed using QIIME2 Next Generation Sequencing (NGS), amino acid was tested with 16 standard HPLC, while Volatile organic compounds (VOC) was tested using GCMS. The results showed that application of antibiotics can change the bacterioma composition of Rhizopus oryzae. The antibacterial application of ampicillin was proven to change the bacterial composition of control isolates dominated by others (98%) to dominant Proteobacteria (99.9%), and antibacterial chloramphenicol was able to reduce the dominance of others to 76% and gave rise to the phylum Proteobacteria (24%). Chloramphenicol treatment produces the highest amino acid. However, on VOC analysis ampicillin treatment had the most diverse VOCs than control and chloramphenicol. From these results, it is proven that changes bacterioma composition in Rhizopus oryzae affect the content of amino acids and VOCs in soybean tempeh.*

*Keywords: Bacteriomas; Interactions; Rhizopus oryzae; Tempeh*