

**Degradasi dan Detoksifikasi Deoxynivalenol pada Jagung (*Zea mays* L)
dengan Fermentasi Substrat Padat
oleh *Aspergillus oryzae* KKB4 dan *Rhizopus oryzae* KP1R1**

INTISARI

Deoxynivalenol merupakan trikotesena tipe B yang dihasilkan oleh *Fusarium graminearum* yang dapat menyebabkan masalah kesehatan yang serius pada manusia dan ternak. Penelitian ini bertujuan untuk menurunkan dan mendetoksifikasi DON menggunakan *Aspergillus oryzae* KKB4 dan *Rhizopus oryzae* KP1R1

Dalam penelitian ini, jagung sebagai substrat padat diinokulasikan dengan *Fusarium graminearum* bio 163252 untuk menghasilkan deoxynivalenol. Jagung yang telah terkontaminasi DON kemudian diinokulasikan dengan *Aspergillus oryzae* KKB4 and *Rhizopus oryzae* KP1R1. Selama fermentasi, penurunan DON diamati termasuk analisa kehilangan bahan kering dan kandungan glukosamin. DON diekstraksi dari substrat menggunakan *solid phase extraction* (SPE) dan dianalisa menggunakan *high-performance liquid chromatography* (HPLC). Uji toksisitas hasil degradasi DON diamati menggunakan *Saccharomyces cerevisiae*.

Hasil penelitian menunjukkan bahwa penurunan deoxynivalenol oleh *Aspergillus oryzae* KKB4 dan *Rhizopus oryzae* KP1R1 sebesar 65,91% dan 56,82%, selama 10 hari fermentasi. Uji toksisitas menunjukkan bahwa hasil degradasi DON tidak toksik pada pertumbuhan sel *Saccharomyces cerevisiae*. Spktrum IR dan LC-MS/MS juga memperlihatkan perubahan dalam gugus fungsional dari produk degradasi DON. Produk degradasi terbanyak diperkirakan mempunyai formula kimia $C_{20}H_{32}O_{11}$ dengan berat molekul 467. Karena itu, *Aspergillus oryzae* KKB4 and *Rhizopus oryzae* KP1R1 mampu menurunkan dan mendetoksifikasi deoxynivalenol dalam substrat padat.

Kata kunci: deoxynivalenol, fermentasi substrat padat, *Aspergillus oryzae* KKB4, *Rhizopus oryzae* KP1R1

**Degradation and Detoxification of Deoxynivalenol in Corn (*Zea mays* L)
with Solid Substrate Fermentation
by *Aspergillus oryzae* KKB4 and *Rhizopus oryzae* KP1R1**

ABSTRACT

Deoxynivalenol is a type B trichothecene produced by *Fusarium graminearum* that can cause serious health problems in human and livestock. The present study aimed to reduced and detoxified using *Aspergillus oryzae* KKB4 and *Rhizopus oryzae* KP1R1

In this research, corn as solid substrate artificially inoculated with *Fusarium graminearum* bio 163252 to produced deoxynivalenol. Deoxynivalenol contaminated corn then inoculated with *Aspergillus oryzae* KKB4 and *Rhizopus oryzae* KP1R1. During fermentation periods, the deoxynivalenol decline investigated included dry matter loss and glucosamine content. Deoxynivalenol was extracted from the substrate by solid phase extraction and quantified using high-performance liquid chromatography. Toxicity assay for DON residues was investigated by using *Saccharomyces cerevisiae*.

The results showed that the reduction of deoxynivalenol by *Aspergillus oryzae* KKB4 and *Rhizopus oryzae* KP1R1 were 65,91% and 56,82%, respectively during ten days fermentation. Toxicity analysis revealed that residues of deoxynivalenol were not toxic to growth of *Saccharomyces cerevisiae* cells. Spectra IR and LC-MS/MS also show changes in functional groups in the degradation products of DON. Most products of degradation are estimated to have the chemical formula $C_{20}H_{32}O_{11}$ with a molecular weight 467. Therefore, *Aspergillus oryzae* KKB4 and *Rhizopus oryzae* KP1R1 were able to reduce and detoxified deoxynivalenol in solid substrates.

Keywords: deoxynivalenol, solid substrate fermentation, *Aspergillus oryzae* KKB4, *Rhizopus oryzae* KP1R1