

**AKTIVITAS SITOTOKSIK EKSTRAK JAMUR ENDOFIT DARI
TANAMAN MIMBA (*Azadirachta indica* A. Juss) DAN
GAMBIR (*Uncaria gambir* (Hunter) Roxb.)**

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ABSTRAK

Aktivitas Sitotoksik Ekstrak Jamur Endofit dari Tanaman Mimba (*Azadirachta indica* A. Juss) dan Gambir (*Uncaria gambir* (Hunter) Roxb.)

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Hubungan simbiosis mutualisme antara tanaman dan jamur endofit merupakan peluang yang menjanjikan dalam penemuan senyawa antikanker. Jamur endofit yang bersimbiosis diketahui mengandung metabolit sekunder yang sama dengan inangnya. Penelitian ini bertujuan untuk mengetahui aktivitas sitotoksik ekstrak etil asetat jamur endofit dari tanaman mimba (*Azadirachta Indica* A. Juss) dan Gambir (*Uncaria Gambir* (Hunter) Roxb.). Dalam penelitian lanjutan ini, telah diisolasi 24 jamur endofit dari kedua tanaman dan diperoleh ekstrak jamur endofit. Skrining aktivitas sitotoksik menggunakan metode *Brine Shrimp Lethality Test* (BSLT) dan *Microculture Tetrazolium* (MTT). Hasil uji BSLT menunjukkan 23 ekstrak tergolong toksik dengan nilai $LC_{50} < 1000 \mu\text{g/mL}$. Pada penelitian ini digunakan satu ekstrak dari masing – masing tanaman dengan nilai $LC_{50} < 100 \mu\text{g/mL}$ untuk pengujian lebih lanjut dengan metode MTT. Jamur endofit dengan kode AIA4 dan UGB1 yang dipilih untuk uji MTT. Hasil uji MTT menunjukkan kedua ekstrak tidak mampu menghambat sel kanker payudara MCF-7. Kedua ekstrak tersebut tergolong tidak toksik dengan nilai IC_{50} AIA4 sebesar $3526,42 \mu\text{g/mL}$ dan UGB1 sebesar $9486,79 \mu\text{g/mL}$. Identifikasi jamur secara makroskopis, mikroskopis dan molekuler menunjukkan bahwa jamur endofit kode AIA4 adalah jamur *Aspergillus oryzae* dan jamur endofit kode UGB1 adalah *Aspergillus terreus*. Berdasarkan hasil penelitian tersebut, dapat disimpulkan bahwa ekstrak jamur *Aspergillus oryzae* dan *Aspergillus terreus* toksik terhadap *nauplii Artemia salina* (L.), namun tidak toksik terhadap *cell line* MCF-7.

Kata kunci : tanaman mimba; tanaman gambir; sitotoksik; jamur endofit; *Aspergillus oryzae*; *Aspergillus terreus*

ABSTRACT

Cytotoxic Activity of Endophytic Fungal Extracts from Neem (*Azadirachta Indica* A. Juss) and Gambir (*Uncaria Gambir* (Hunter) Roxb.) Plants

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A mutualistic symbiotic relationship between plants and endophytic fungi is a promising opportunity in the discovery of anticancer compounds. Symbiotic endophytic fungi are known to contain the same secondary metabolites as their hosts. This study aims to determine the cytotoxic activity of ethyl acetate extract of endophytic fungi from Neem (*Azadirachta indica* A. Juss) and Gambir (*Uncaria gambir* (Hunter) Roxb.) plants. In this follow-up study, 24 endophytic fungi from both plants were isolated and endophytic fungal extracts were obtained. Cytotoxic activity screening using *Brine Shrimp Lethality Test* (BSLT) and *Microculture Tetrazolium* (MTT) methods. BSLT test results showed 23 extracts classified as toxic with $LC_{50} < 1000 \mu\text{g/mL}$. In this study, one extract from each plant with $LC_{50} < 100 \mu\text{g/mL}$ was used for further testing with the MTT method. Endophytic fungi code AIA4 and UGB1 were selected for the MTT test. The MTT test results showed that both extracts were unable to inhibit MCF-7 cell line. Both extracts were classified as non-toxic with IC_{50} values of AIA4 of 3526,42 $\mu\text{g/mL}$ and UGB1 of 9486,79 $\mu\text{g/mL}$. The MTT test results showed that both extracts were unable to inhibit MCF-7 breast cancer cells. Both extracts were classified as non-toxic with IC_{50} values of AIA4 of 3526,42 $\mu\text{g/mL}$ and UGB1 of 9486,79 $\mu\text{g/mL}$. Macroscopic, microscopic and molecular identification of fungi showed that the endophytic fungus code AIA4 was *Aspergillus oryzae* and the endophytic fungus code UGB1 was *Aspergillus terreus*. Based on the results of this study, it can be concluded that the extracts of *Aspergillus oryzae* and *Aspergillus terreus* are toxic to *Artemia salina* (L.) *nauplii*, but not toxic to MCF-7 cell line.

Keywords: Neem plant; gambir plant; cytotoxic; endophytic fungi; *Aspergillus oryzae*; *Aspergillus terreus*