

## ABSTRAK

### ANALISIS FITOKIMIA DAN AKTIVITAS ANTIBAKTERI JAMUR ENDOFIT SIMBION NUDIBRANCHIA YANG DIKULTUR PADA MEDIA BERAS DENGAN PENAMBAHAN GARAM KROSOK

Kharisma Aulia Cintansih<sup>1</sup>, Harwoko<sup>2</sup>, Triyadi Hendra Wijaya<sup>2</sup>

**Latar Belakang:** Mekanisme adaptif bakteri penyebab tuberkulosis (TB) yang menyebabkan pasien tidak efektif terhadap terapi obat menjadi ancaman dalam pengendalian TB sehingga perlu pencarian senyawa bioaktif baru. Nudibranchia dan jamur endofit dilaporkan berpotensi sebagai senyawa antimikroba. Namun, kultur jamur endofit dalam kondisi laboratorium standar sering gagal akibat klaster gen biosintesis yang tidak aktif. Penerapan strategi *One Strain MAny Compounds* (OSMAC) menjadi penyelesaian permasalahan tersebut. Penelitian ini bertujuan untuk mengisolasi jamur endofit simbion Nudibranchia dan mengidentifikasi metabolit serta menguji aktivitas antibakterinya.

**Metodologi:** Jamur endofit kode 8 simbion Nudibranchia diinokulasi pada media PDA hingga diperoleh isolat murni. Jamur endofit dikultivasi pada media beras dengan penambahan garam krosok sebagai penerapan OSMAC dan media beras tanpa garam krosok (non OSMAC). Jamur diekstraksi dengan etil asetat dan difraksinasi dengan metanol:n-heksana lalu dianalisis fitokimia dengan KLT. Selanjutnya pada ekstrak EtOAc, fraksi MeOH dan fraksi n-heksana jamur endofit diuji aktivitas antibakteri terhadap *Mycobacterium smegmatis* dengan metode difusi cakram.

**Hasil:** Berdasarkan profil KLT, ekstrak EtOAc dan fraksi MeOH jamur endofit simbion Nudibranchia hasil OSMAC mengandung alkaloid, flavonoid, polifenol dan steroid yang berbeda dengan kultur non OSMAC yang hanya mengandung flavonoid, polifenol dan steroid. Fraksi MeOH OSMAC menunjukkan aktivitas penghambatan terhadap *M. smegmatis* dengan diameter zona hambat sebesar 0,5 mm (lemah), sedangkan pada ekstrak EtOAc non OSMAC tidak menunjukkan aktivitas antibakteri.

**Kesimpulan:** Jamur endofit simbion Nudibranchia kode 8 yang dikultur dengan metode OSMAC pada media beras dengan penambahan garam krosok menginduksi metabolit sekunder yang lebih beragam dan berpotensi sebagai antibakteri terhadap *M. smegmatis*.

**Kata Kunci:** Antibakteri, garam krosok, jamur endofit, Nudibranchia, OSMAC.

<sup>1</sup>Mahasiswa Jurusan Farmasi Fakultas Ilmu-Ilmu Kesehatan Universitas Jenderal Soedirman

<sup>2</sup>Jurusan Farmasi Fakultas Ilmu-Ilmu Kesehatan Universitas Jenderal Soedirman

## ABSTRACT

### PHYTOCHEMICAL ANALYSIS AND ANTIBACTERIAL ACTIVITY OF ENDOPHYTIC FUNGI ASSOCIATED WITH NUDIBRANCHIA CULTURED ON RICE MEDIA WITH THE ADDITION OF COARSE SALT

Kharisma Aulia Cintansih<sup>1</sup>, Harwoko<sup>2</sup>, Triyadi Hendra Wijaya<sup>2</sup>

**Background:** The adaptive mechanism of bacteria that caused tuberculosis (TB) which causes patients to be ineffective against drug therapy is a threat in controlling TB, so it is necessary to search for new bioactive compounds. Nudibranchia and endophytic fungi were reported to have potential as antimicrobial. Nevertheless, endophytic fungi cultures under standard laboratory conditions often fail due to inactive biosynthetic gene clusters. The application of the *One Strain MAny Compounds* (OSMAC) strategy is a solution to this problem. This study aims to isolate the endophytic fungi associated with Nudibranchia, to identify fungal metabolites and to evaluate their antibacterial activity.

**Methodology:** Endophytic fungi associated with Nudibranchia code 8 were inoculated on PDA media until pure isolates were obtained. Endophytic fungi were cultivated on rice media with the addition of coarse salt as an application of OSMAC and on rice media without coarse salt (non OSMAC). The endophytic fungi were extracted with ethyl acetate and fractionated with methanol:n-hexane then analyzed for phytochemistry by TLC. Furthermore, the EtOAc extract, MeOH fraction and n-hexane fraction of endophytic fungi were tested for antibacterial activity against *Mycobacterium smegmatis* using the disk diffusion method.

**Results:** Based on the TLC profile, the EtOAc extract and MeOH fraction of the endophytic fungi associated with Nudibranchia resulting from OSMAC contained alkaloid, flavonoid, polyphenol and steroid which had different compared to cultured with non-OSMAC which only contained flavonoid, polyphenol and steroid. The MeOH OSMAC fraction showed inhibitory activity against *M. smegmatis* with an inhibitory zone diameter of 0,5 mm (weak), while the EtOAc non OSMAC extract did not show any antibacterial activity.

**Conclusion:** The endophytic fungi associated with Nudibranchia code 8 cultured using the OSMAC method on rice media with the addition of coarse salt induced more diverse secondary metabolites and has potential as an antibacterial against *M. smegmatis*.

**Keywords:** Antibacterial, coarse salt, endophytic fungi, Nudibranchia, OSMAC.

<sup>1</sup>Student of Pharmacy, Faculty of Health Sciences, Jenderal Soedirman University

<sup>2</sup>Departement of Pharmacy, Faculty of Health Sciences, Jenderal Soedirman University