AKTIVITAS ANTIVIRUS EKSTRAK AIR *Streptomyces* sp. GMY01 TERHADAP VIRUS AVIAN INFLUENZA H5N1

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INTISARI

Flu burung atau Avian Influenza (AI) adalah suatu penyakit menular yang disebabkan oleh virus influenza yang ditularkan oleh unggas. Genus Streptomyces mampu memproduksi enzim ekstraseluler dan ribuan metabolit sekunder yang dapat disintesis menjadi herbisida, pestisida, antivirus, dan antibiotik lainnya. Penelitian ini dilakukan untuk mempelajari potensi ekstrak air *Streptomyces* sp. GMY01 sebagai antivirus AI H5N1. Aktivitas antivirus ini diuji dengan menginokulasi virus AI H5N1 clade 2.3.2 dan ekstrak air *Streptomyces* sp. GMY01 konsentrasi 125, 250, 500, dan 1000 µg/ml ke dalam telur *Specific Antibody Negative* (SAN) berembrio umur 9-11 hari dengan variasi volume pengenceran virus dimulai dari EID_{50}. Inkubasi dilakukan selama 2-5 hari. Cairan alantois diuji haemagglutinasi (HA) kualitatif dan kuantitatif yang bertujuan untuk mengamati aktivitas haemagglutinasi antigen H terhadap sel darah merah. *Real time* RT-PCR dikerjakan untuk mengetahui efek penghambatan replikasi virus oleh ekstrak air *Streptomyces* sp. GMY01. Hasil uji aktivitas HA yang didapat menunjukkan ekstrak air *Streptomyces* sp. GMY01 berpotensi menghambat pertumbuhan virus pada konsentrasi 500 dan 1000 µg/ml. Berdasarkan hasil *real-time* RT-PCR, ekstrak *Streptomyces* sp. GMY01 konsentrasi 500 µg/ml memiliki *threshold cycle* (CT) yang negatif, menandakan tidak terdapat virus pada konsentrasi tersebut. Hasil *real time* RT-PCR pada penelitian ini hanya dapat menunjukkan konsentrasi yang lebih tinggi terhadap kontrol (+) PCR yang digunakan dan belum dapat disimpulkan adanya penghambatan replikasi virus.

Kata kunci : Antivirus, Avian Influenza, H5N1, HA, *Streptomyces* sp. GMY01

ANTIVIRAL ACTIVITY OF WATER EXTRACTS OF *Streptomyces* sp. GMY01 AGAINST H5N1 AVIAN INFLUENZA VIRUS

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ABSTRACT

Bird flu or Avian Influenza (AI) is an infectious disease caused by influenza viruses that are transmitted by birds. Genus Streptomyces can produce extracellular enzymes and thousands of secondary metabolites that can be synthesized into herbicides, pesticides, antivirals, and another antibiotics. This research was aimed to study the potential of water extracts of *Streptomyces* sp. GMY01 as an antiviral for AI H5N1. This antiviral activity was evaluated by inoculating AI H5N1 virus clade 2.3.2 and water extracts of *Streptomyces* sp. GMY01 with concentrations of 125, 250, 500, and 1000 µg/ml in 9-11 days old *Specific Antibody Negative* (SAN) embryonated chicken eggs with dilution volume of virus starts from EID_{50}. Incubation was done for 2-5 days. Allantoic fluid was tested by using qualitative and quantitative haemagglutination (HA) that intend to watch haemagglutination activities between H antigen and red blood cells. *Real-time* RT-PCR was used to determine the virus replication inhibitor of water extracts of *Streptomyces* sp. GMY01. The result of HA activity showed potential viral growth inhibition at 500 and 1000 µg/ml of water extracts of *Streptomyces* sp. GMY01. Based on *real-time* RT-PCR results, water extracts of *Streptomyces* sp. GMY01 at concentration 500 µg/ml has negative *threshold cycle* (CT), that means there's no virus in that concentration. In this experiment, *real time* RT-PCR results only showed higher viral concentration of sample compare the PCR control (+) and can not be concluded for inhibition of viral replication.

Keywords: Antiviral, Avian Influenza, H5N1, HA, *Streptomyces* sp. GMY01