Genotyping dan *Pathotyping* Isolat Lapang Virus Newcastle Disease Subgenotipe VIIg, VIIh dan VIIi *In Ovo* dan *In Vivo*

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INTISARI

Penyakit Newcastle Disease adalah salah satu penyakit virus menular pada unggas terutama ayam. Wabah ND disebabkan oleh Newcastle Disease Virus (NDV) dan menjadi tantangan industri perunggasan akibat kerugian ekonomi yang disebabkannya. Virus ND yang menjangkit sebagian besar unggas di Indonesia adalah ND Genotipe VII. Virus ND Genotipe VII yang ditemukan saat ini sangat beragam. Penelitian ini bertujuan untuk membandingkan karakteristik molekular serta patogenisitas *in ovo* dan *in vivo* virus antara ND subgenotipe VIIg, VIIh dan VIIi sebagai uji awal dalam pemilihan kandidat *seed* vaksin. Propagasi virus dilakukan pada telur ayam berembrio umur 10 hari. Cairan alantois telur dipanen, dilakukan uji hemaglutinasi dan *Reverse Transcriptase Polymerase Chain Reaction* (RT-PCR). Untuk genotipe isolat dilakuan sekuensing dengan menggunakan fragmen gen Fusi dengan daerah amplifikasi 1 sampai dengan 1099. Uji patogenisitas dilakukan pada Telur Ayam Berembrio (TAB) untuk mengetahui *Mean Death Time* (MDT), *Intravena Pathogenicity Index* (IVPI) dan pengamatan histopatologi dilakukan menggunakan ayam *Specific Pathogen Free* (SPF). Hasil karakterisasi molekular ND subgenotipe VIIh dan VIIi diidentifikasikan sebagai strain virulen dengan motif ^{112}RRQR/KRF^{117} pada bagian *cleavage site* sedangkan subgenotipe VIIg memiliki motif ^{112}GRQGRL^{117} sehingga teridentifikasi kurang virulen. Hasil uji MDT, IVPI serta pengamatan histopatologi menunjukkan kematian <60 jam dengan index IVPI 3.0 serta organ limfoid teramati terjadi deplesi limfosit dan atropi untuk virus ND subgenotipe VIIh dan VIIi, sedangkan subgenotipe VIIg mengalami kematian >60 jam, index IVPI 0.0 serta organ limfoid menunjukkan deplesi limfosit ringan. Data penelitian ini menunjukkan bahwa isolat ND subgenotipe VIIg termasuk strain mesogenik sedangkan subgenotipe VIIh dan VIIi merupakan strain velogenik.

Kata kunci : Genotipe VII, Subgenotipe VIIg, Subgenotipe VIIh, Subgenotipe VIIi, Newcastle disease, Organ limfoid

Genotyping and Pathotyping of Field Isolates of Newcastle Disease Virus Subgenotypes VIIg, VIIh, and VIIi in Ovo and In Vivo

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ABSTRACT

Newcastle Disease (ND) is an infectious viral poultry disease, especially chicken. ND outbreaks was caused by Newcastle Disease Virus (NDV) and became a major economic challenge for the poultry industry due to the economic losses it caused. The most ND virus that infects Indonesian poultry is ND Genotype VII. This time, ND Genotype VII is very diverse. This study aims to compare molecular characteristics, in ovo and in vivo pathogenicity between NDV subgenotype VIIg, VIIh, and VIIi as an initial test in the selection of vaccine seed candidates. Virus propagation was performed on 10 days old embryonated Specific Pathogen Free (SPF) chick eggs. The allantoic fluid was harvested and their hemagglutination agents were identified by Reverse Transcription Polymerase Chain Reaction (RT-PCR). For the isolate genotype using the Fusion gene Fragment with amplification areas of 1 to 1099. Pathogenicity tests were carried out on Embryonic Chicken Eggs (ECE) to determine Mean Death Time (MDT), Intravenous Pathogenicity Index (IVPI), and histopathological observations were carried out using Specific Pathogen Free (SPF) chickens. The results of the molecular characterization of ND subgenotypes VIIh and VIIi were indentified as virulent strains with the motif ^{112}RRQR/KRF^{117} at the cleavage site, while the VIIg subgenotype had the motif ^{112}GRQGRL^{117}, it was identified as less virulent. MDT, IVPI and histopathological observation showed death <60 hours with IVPI index 3.0 and lymphoid organs observed lymphocyte depletion and atrophy for ND virus subgenotypes VIIh and VIIi, while subgenotype VIIg experienced death >60 hours, IVPI index 0.0 and lymphoid organs showed mild lymphocyte depletion. The data of this study indicate that the ND isolates of subgenotype VIIg are mesogenic strains, while the subgenotypes VIIh and VIIi are velogenic strains.

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Keywords : Genotype VII, Subgenotype VIIg, Subgenotype VIIh, Subgenotype VIIi, Newcastle disease, Limfoid organs