INTISARI

Latar Belakang. Demam Berdarah Dengue (DBD) merupakan infeksi virus dengue (arbovirus) yang dikenal sebagai masalah kesehatan di Indonesia maupun di berbagai negara di seluruh dunia. Dalam upaya pengendalian vektor, banyak dilakukan pemeliharaan nyamuk di laboratorium dan untuk menjaga kelangsungan hidup nyamuk maka nyamuk memerlukan darah. Pengendalian vektor sebagai upaya menurunkan faktor resiko penularan virus dengue. Pengendalian vektor dengue adalah dengan mempelajari pengaruh variasi golongan darah terhadap fekunditas dan fertilitas telur nyamuk *Aedes aegypti.* Manusia yang mengandung virus dengue apabila digigit oleh nyamuk maka virus dapat masuk ke dalam tubuh nyamuk dan nyamuk menjadi infektif. Metode untuk mendeteksi virus dengue yaitu imunositokimia SBPC dan qRT-PCR.
Tujuan Penelitian. Penelitian ini secara umum bertujuan untuk menganalisis hubungan variasi golongan darah terhadap produktivitas telur dan transmisi virus dengue (DENV) melalui metode *Artificial Membrane Feeding*.
Metode Penelitian. Empat ratus sampel nyamuk *Ae. aegypti* hasil dari kolonisasi di laboratorium Parasitologi FK-KMK UGM dengan umur 1-2 minggu dibagi menjadi 4 kelompok, setiap kelompok diulang 4 kali untuk diinfeksi DENV-3 *per oral* melalui *Artificial Membrane Feeding* dengan variasi golongan darah yang berbeda: A, B, AB, dan O. Fekunditas telur dihitung seminggu *pasca* inokulasi, fertilitas telur diukur dengan menghitung jumlah larva yang menetas pada telur yang disimpan selama 15 hari pada suhu kamar, dan direndam selama seminggu dalam cawan berisi 20 ml air kran. Keberadaan virus dengue ditegakkan berdasarkan metode imunositokimia SBPC Antibodi Monoklonal DSSE10 pada sediaan *head squash* dan qRT-PCR pada bagian caput dan thorax nyamuk.
Hasil Penelitian. Nilai rerata fekunditas telur pada kelompok golongan darah B adalah 17 butir, pada kelompok golongan darah O adalah 177,50 butir, pada kelompok golongan darah A dan AB adalah 0 butir, sedangkan nilai rerata fertilitas telur pada kelompok golongan darah B adalah13,25 butir, pada kelompok golongan darah O 174,75 butir, pada kelompok golongan darah A dan AB adalah 0 butir. Keberadaan antigen dengue pada sediaan *head squash* pada golongan darah B dengan nilai *Positive Infection Rate* (PIR) sebesar 0,69% pada ulangan 3 dan nilai rata-rata PIR pada golongan darah O sebesar 1,71%, dan keberadaan virus DENV-3 pada caput dan thorax nyamuk hanya dijumpai pada kelompok golongan darah O Ulangan I dengan nilai *Summary Quantification* (SQ) $748x10^4$ *per pooling* (10 ekor).
Kesimpulan. Terdapat pengaruh antara variasi golongan darah terhadap fekunditas, fertilitas telur, *viral load* DENV-3 dan *positive infection rate* nyamuk *Ae. aegypti* yang diinfeksi DENV-3 secara *per oral* melalui metode *Artificial Membrane Feeding*.

Kata kunci: *Ae. aegypti*, Golongan darah ABO, Virus Dengue.

ABSTRACT

Background. Dengue hemorrhagic fever (DHF) is a mosquito-borne disease caused by an arbovirus infection known as an epidemic disease in Indonesia and other tropical countries. One of the factors associated with the inspection of dengue viruses is blood group based on ABO blood-group system that commonly used in human blood classification.

Objective. This study aims to analyze the correlation between blood groups variation on egg productivity and dengue virus infection (DENV) through the *Artificial Membrane Feeding* method.

Method. 100 samples of *Aedes aegypti* in Parasitology laboratory FK-KMK UGM aged five days were classified into four groups. Each group was infected with DENV-3 orally through *Artificial Membrane Feeding* four times based on the varieties of blood groups: A, B, AB, and O. Egg Fecundity was calculated a week after inoculation. Then, the egg fertility was measured by counting the number of larvae that hatched out from the eggs stored in 15 days at room temperature. The larva had been soaked for a week in a cup of 20 ml of water. The presence of DENV on head squashes was performed based on the immunocytochemical *streptavidin peroxidase complex (ISBPC) assay* using DSSE10 monoclonal antibody made in UGM as a primary antibody and the qRT-PCR on the parts of head and thorax of mosquitoes.

Results. It was not found eggs in the blood group A and AB. The median eggs fecundity of *Ae. aegypti* in the blood group B and O were 6.5 and 92.5 respectively, whereas the median eggs fertility of *Ae. aegypti* in the blood group B and O were 2.5 and 90 respectively. The median eggs fecundity and fertility of Ae. aegypti in the O groups were significantly hihger than in the other groups ($P<0.05$). It is also not found DENV in the blood group A and AB. The DENV antigen on head squashes preparation was found in the 3rd replicate of B group with positive infection rate of 2%, and the 1st, 2nd, 3rd, and the 4th replicate of O groups with positive infection rate of2,655, 2.38%, 1.26%, and 0.55%
respectively. Another result indicated that the DENV-3 in the head and thorax was only found in the first replicate of blood group O with the Summary Quantification (SQ) $of\ 748x10^4$ *per pooling* (10 mosquitoes) based on q-RT-PCR

Conclusion. The blood O group was the best source for colonization and providing DENV antigen under laboratory condition through AMF**.** There is a correlation between the variation of blood group towards the eggs fecundity, eggs fertility, *viral load* DENV-3 and *positive infection rate* in *Ae. Aegypti* that infected orally by DENV-3 through *Artificial Membrane Feeding* method.

Keywords: *Ae. aegypti*, Blood group ABO, Dengue virus.