

**STATUS RESISTENSI TERHADAP INSEKTISIDA ORGANOFOSFAT
DAN PROFIL ISOENZIM ESTERASE NON-SPEKIFIK NYAMUK
Aedes spp. (Diptera: Culicidae) DARI DAERAH ENDEMIS DAN NON
ENDEMIS DBD DI WILAYAH DAERAH ISTIMEWA YOGYAKARTA**

INTISARI

Latar Belakang: Penyakit Demam Berdarah Dengue (DBD) masih menjadi masalah kesehatan masyarakat yang utama antara lain di wilayah DIY yaitu di Kelurahan Sorosutan, Kota Yogyakarta. Namun demikian, masih ada daerah non endemis yaitu di Kelurahan Janten, Kabupaten Kulon Progo. Kajian tentang status resistensi nyamuk *Aedes spp.* terhadap insektisida organofosfat di daerah endemis sudah banyak dilakukan, namun belum ada kajian mengenai profil isoenzim esterase non-spesifiknya.

Tujuan Penelitian: Penelitian ini bertujuan untuk mengetahui status resistensi, aktivitas enzim esterase non-spesifik, dan profil isoenzim esterase non-spesifik nyamuk *Aedes spp.* dari Kelurahan Sorosutan (endemis) dan Janten (non endemis) terhadap insektisida organofosfat.

Metode: Penelitian eksperimental dengan rancangan *The Post Only Control Group Design* dilakukan untuk mengetahui status resistensi nyamuk *Aedes spp.* secara hayati terhadap insektisida malation dan larva instar 3 terhadap larvisida temefos. Uji biokemis untuk mengetahui level aktivitas enzim esterase non-spesifik-naftilterhadapasetat dilakukan dengan *microplate assay* sedangkan profil isoenzimnya dengan elektroforesis terhadap nyamuk *Aedes spp.* Populasi penelitian ini yaitu semua nyamuk *Aedes spp.* dari Kelurahan Sorosutan dan Janten.

Hasil Penelitian: Nyamuk *Aedes spp.* daerah endemis toleran terhadap malation dengan metode CDC. Larva nyamuk *Aedes spp.* telah toleran di RW 08 dan 11, serta masih rentan di RW 03, 13, dan 15 terhadap temefos. Peningkatan aktivitas enzim esterase non-spesifik dijumpai pada nyamuk *Aedes spp.* di 4 RW daerah endemis dan 2 dusun di daerah non endemis. Nyamuk dari daerah endemis, non endemis dan kontrol positif memiliki 6 pita isoenzim esterase non-spesifik yaitu Est A1, Est A2, Est A3, Est A4, Est A5 dan Est A6 dengan ketebalan yang sama kecuali pita Est A6, sedangkan nyamuk kontrol negatif hanya memiliki 5 pita yaitu Est A1, Est A2, Est A3, Est A4, dan Est A6.

Kesimpulan: Nyamuk *Aedes spp.* dari daerah endemis termasuk toleran terhadap malation tetapi larvanya sebagian besar masih rentan terhadap temefos. Aktivitas enzim esterase non-spesifik nyamuk *Aedes spp.* dari daerah endemis lebih tinggi daripada nyamuk di daerah non endemis. Nyamuk *Aedes spp.* dari daerah endemis dan non endemis memiliki 6 pita isoenzim esterase non-spesifik.

Kata Kunci: DBD, *Aedes spp.*, resistensi, isoenzim esterase non spesifik

**RESISTANCE STATUS TO ORGANOPHOSPHAT INSECTICIDE AND
NON-SPEKIFIC ESTERASE ISOENZYMES PROFILE OF *Aedes spp.*
MOSQUITOES (DIPTERA: CULICIDAE) FROM ENDEMIC AND NON
ENDEMIC AREAS IN THE REGION OF YOGYAKARTA**

ABSTRACT

Background: Dengue Hemorrhagic Fever (DHF) is still a major public health problem like in the region of Yogyakarta, which is in the Sorosutan village, Yogyakarta city. Nevertheless, there is a still non-endemic area, which is in the Janten village, Kulon Progo regency. Studies on the resistance status of *Aedes spp.* mosquitoes to organophosphate insecticide in endemic areas have been done, but there were no studies about their profile of the non-specific esterase isoenzymes.

Objective: This study has performed to determine the status of resistance, activity of non-specific esterase enzyme, and profile of non-specific esterase isoenzyme bands of *Aedes spp.* on Sorosutan (endemic) and Janten villages (non-endemic) to organophosphate insecticide.

Methods: The experimental study with the Post Only Control Group Design was conducted to determine the resistance status of *Aedes spp.* by bioassay to malathion insecticide and third instar larvae to temephos larvicide. Biochemical test to determine the activity level of non-specific esterase enzyme to α -naphthyl acetate made by microplate assay whereas its isoenzyme profile made by electrophoresis to *Aedes spp.* mosquitoes. This study population is all *Aedes spp.* mosquitoes of Sorosutan and Janten villages.

Results: Adults *Aedes spp.* on endemic area are tolerant to malathion with CDC method. *Aedes spp.* larvae have been tolerant in RW 08 and 11, and still susceptible in RW 03, 13, and 15 to temephos. The increase of non-specific esterase enzymes activities found in *Aedes spp.* mosquitoes of 4 RW in endemic area and 2 dusun in non-endemic area. The endemic area, non-endemic area and the positive control mosquitoes have 6 non-specific esterase isoenzyme bands namely Est A1, Est A2, Est A3, Est A4, Est A5, and Est A6 with the same thickness except the Est A6 band, whereas the negative control mosquitoes only have 5 bands, namely Est A1, Est A2, Est A3, Est A4 and Est A6.

Conclusion: *Aedes spp.* of endemic area was tolerant to malathion but the larvae was still susceptible to temephos. The activity of non-specific esterase enzyme of *Aedes spp.* from endemic area is higher than mosquitoes in non-endemic area. *Aedes spp.* mosquitoes of endemic and non-endemic areas have 6 non-specific esterase isoenzyme bands.

Keywords: DHF, *Aedes spp.*, resistance, non-specific esterase isoenzyme