

## INTISARI

**Latar Belakang:** Demam Dengue (DD) tetap menjadi masalah kesehatan masyarakat di Indonesia, termasuk di Kota Mataram. Pada pertengahan 2024, Puskesmas Karang Pule melaporkan 300 kasus DD. Faktor risiko meliputi kepadatan penduduk tinggi, perilaku masyarakat yang kurang mendukung pemberantasan sarang nyamuk (PSN), serta kondisi iklim yang mempercepat perkembangbiakan *Aedes aegypti*. Selain itu, resistensi nyamuk terhadap insektisida sipermetrin diduga mengurangi efektivitas pengendalian vektor.

**Tujuan:** Penelitian ini bertujuan untuk: 1. Mengetahui dan menganalisis parameter entomologi dan status maya index, sehingga diketahui resiko penularan di daerah Puskesmas Karang Pule, (2) menganalisis faktor lingkungan abiotik yang memengaruhi peningkatan kepadatan vektor DD, (3) menguji resistensi *Aedes aegypti* terhadap sipermetrin, dan (4) mengidentifikasi mutasi gen *VGSC* sebagai mekanisme resistensi.

**Metode:** Penelitian observasional analitik dengan desain *cross-sectional* dilakukan di wilayah Puskesmas Karang Pule. Survei jentik dan pemasangan *ovitrap* dilakukan untuk menilai indeks entomologi. Uji resistensi menggunakan *CDC Bottle Bioassay* (sipermetrin 10 µg/ml), dilanjutkan analisis mutasi gen *VGSC* melalui PCR dan *sequencing*.

**Hasil:** Nilai *House Index* (HI=43%), *Container Index* (CI=22%), dan *Breteau Index* (BI=93) melebihi standar WHO, menunjukkan risiko penularan tinggi. Uji resistensi menunjukkan *knockdown* <60% dalam 30 menit dan <50% setelah 24 jam, mengindikasikan resistensi. Analisis genetik didapatkan mutasi komplementer yaitu S989P.

**Kesimpulan:** Wilayah Puskesmas Karang Pule memiliki risiko penularan DD yang tinggi, adanya resistensi nyamuk terhadap sipermetrin dikonfirmasi dengan mutasi gen *VGSC* (S989P), sehingga diperlukan strategi pengendalian vektor alternatif di daerah ini.

**Kata Kunci:** Demam Berdarah Dengue, *Aedes aegypti*, resistensi insektisida, mutasi gen *VGSC*, sipermetrin.

## ABSTRACT

**Background:** *Dengue Fever (DF) remains a significant public health concern in Indonesia, including Mataram City. By mid-2024, the Karang Pule Community Health Center reported 300 DHF cases. Risk factors include high population density, low community participation in source reduction nest eradication (PSN), and climatic conditions favoring Aedes aegypti proliferation. Additionally, mosquito resistance to cypermethrin insecticide is suspected to reduce vector control efficacy.*

**Objectives:** *This study aimed to: Determine and analyze entomological parameters and the Maya Index status to assess the risk of transmission in the Karang Pule Health Center area, analyze abiotic environmental factors influencing the increase in dengue vector density, test the resistance of Aedes aegypti to cypermethrin., Identify VGSC gene mutations as a mechanism of resistance.*

**Methods:** *An analytical observational study with a cross-sectional design was conducted in Karang Pule. Larval surveys and ovitrap placements were used to evaluate entomological indices. Resistance testing employed CDC Bottle Bioassay (cypermethrin 10 µg/ml), followed by VGSC gene mutation analysis via PCR and sequencing.*

**Results:** *Entomological indices exceeded WHO thresholds (House Index, HI=43%; Container Index, CI=22%; Breteau Index, BI=93), indicating high transmission risk. Resistance testing revealed <60% knockdown at 30 minutes and <50% at 24 hours, confirming resistance. Genetic analysis identified the VGSC S989P mutation.*

**Conclusion:** *The Karang Pule area exhibits high DHF transmission risk, with confirmed cypermethrin resistance linked to VGSC mutations. Alternative vector control strategies are urgently needed in this region.*

**Keywords:** *Dengue Hemorrhagic Fever, Aedes aegypti, insecticide resistance, VGSC gene mutation, cypermethrin.*