KOMPETENSI VEKTORAL DAN POLIMORFISME GENETIK *Anopheles* spp (DIPTERA: ANOPHELINAE) DI DAERAH ENDEMIS MALARIA DI KECAMATAN KOKAP KABUPATEN KULON PROGO

Andiyatu
Program Pascasarjana, Fakultas Biologi, Universitas Gadjah Mada, Yogyakarta

INTISARI

Perbedaan endemisitas malaria di daerah endemis tinggi (Hargotirto) dan daerah endemis rendah (Hargomulyo) dalam kecamatan yang sama, Kecamatan Kokap Kabupaten Kulon Progo, memunculkan pertanyaan apakah perbedaan endemisitas di kedua desa tersebut terkait dengan karakteristik populasi anggota Genus *Anopheles* di wilayah setempat. Tujuan penelitian ini untuk mengetahui karakteristik populasi anggota Genus *Anopheles* di kedua desa tersebut dalam hal: (1) kompetensi vektoral, (2) infektifitas, (3) kelimpahan nisbi, (4) struktur atau rentang umur, (5) perilaku antropofilik, dan (6) tingkat polimorfisme genetik. Subjek penelitian adalah *Anopheles* sp yang dinyatakan sebagai (*suspect*) vektor malaria pada penelitian sebelumnya (*An. vagus*, *An. maculatus*, *An. balabacensis* dan *An. aconitus*). Sampel nyamuk dikumpulkan secara serempak di kedua desa, masing-masing lima kali selama Oktober sampai Desember 2013, dengan interval 2 minggu. Pengambilan sampel nyamuk menggunakan aspirator mekanis dan metoda *resting collection.* Di setiap desa dilaksanakan penangkapan nyamuk di tiga rumah oleh dua orang penangkap per rumah, yaitu satu di dalam dan satu di luar rumah. Setiap kali pengambilan sampel dilakukan penangkapan nyamuk sebanyak 12 kali, dengan lama waktu penangkapan 50 menit per jam, dimulai pukul 18.00 sampai 06.00. Nyamuk hasil koleksi di lapangan dilakukan pemeriksaan: (1) identifikasi spesies, (2) status abdomen, dan (3) status paritas. Tiga jenis pemeriksaan laboratorium dilakukan pada *An. maculatus*, *An. balabacensis*, *An. aconitus* dan *An. vagus* yang memenuhi kriteria sampel (*parous*, *fully fed* atau *half gravid*), yaitu: (1) *Multiplex-Polymerase Chain Reaction*/PCR untuk deteksi sporozoit *Plasmodium* sp pada nyamuk *parous*, (2) *Random Amplified Polymorphic DNA* (RAPD) PCR untuk identifikasi polimorfisme genetik pada nyamuk *parous*, dan (3) *Enzyme-Linked Immunosorbent Assay* (ELISA) untuk identifikasi darah manusia di abdomen nyamuk *fully fed* atau *half gravid*. Analisis hasil pemeriksaan di lapangan dan di laboratorium menunjukkan ada perbedaan karakteristik populasi anggota Genus *Anopheles* di kedua desa, yang ditunjukkan anggota Genus *Anopheles* sp di desa endemis malaria tinggi memiliki proporsi yang lebih tinggi pada semua variabel, kecuali tingkat polimorfisme genetik. Indeks Polimorfisme genetik intra populasi *Anopheles* sp relatif sama tinggi (≥ 90%), tetapi Indeks Similaritas inter populasi rendah (< 70%). Dengan demikian disimpulkan endemisitas malaria yang lebih tinggi di daerah endemis tinggi di Kecamatan Kokap terkait dengan kompetensi vektoral, infektifitas, kelimpahan, struktur umur, dan sifat antropofilik yang lebih tinggi pada populasi *Anopheles* sp di wilayah setempat.

Kata kunci: *Anopheles* spp, kompetensi vektoral, infektivitas, endemisitas, polimorfisme genetik.

VECTORAL COMPETENCE AND GENETIC POLYMORPHISM OF *Anopheles* spp (DIPTERA: ANOPHELINAE) IN MALARIA ENDEMIC AREAS IN THE KOKAP SUB-DISTRICT, KULON PROGO DISTRICT

Andiyatu
Graduate Program, Faculty of Biology, Gadjah Mada University, Yogyakarta

ABSTRACT

Malaria endemicity differences between a high endemic village (Hargotirto) and a low endemic village (Hargomulyo) in the same sub-district, the Kokap Sub-district of the Kulon Progo District, raises the question whether or not it is related to differences in the local Genus *Anopheles* member population. The purpose of the study was to investigate the Anopheles spp population characteristics in the two villages, regard to: (1) vectoral competence, (2) infectivity, (3) relative abundance, (4) structure or life span, (5) anthrophilic behavior; and, (6) genetic diversity of the Genus *Anopheles* member population. The research subjects were *Anopheles* sp that were regarded as (suspect) competent vectors in preceding studies (*An. vagus*, *An. maculatus*, *An. balabacensis* dan *An. aconitus*). Mosquito samples were concurrently collected five times (in two-week intervals) in the two villages during October-December 2013 by using a mechanical aspirator and the resting collection method. In each village the collection was conducted in three houses by two collectors for each house (one inside and one outside). Each mosquito collection was carried out in twelve sessions (50 minutes each) from 18.00 pm to 06.00 am. The research subjects were identified according to the guidelines of O'Connor & Soepanto (1999). Three types of laboratory tests were performed on *An. maculatus*, *An. balabacensis*, *An. aconitus* and *An. vagus* that met the sample inclusion criteria (female parous, and fully fed or half gravid): (1) *Multiplex-Polymerase Chain Reaction/*PCR for *Plasmodium* sp sporozoit detection in *parous* mosquitoes; (2) *Random Amplified Polymorphic DNA* (RAPD) PCR for genetic polymorphism identification in *parous* mosquitoes; and, (3) *Enzyme-Linked Immunosorbent Assay* (ELISA) for human blood identification in the abdomen of *fully fed* or *half gravid* mosquitoes. Analyses of field and laboratory findings showed noticeable differences in the Genus *Anopheles* member population characteristics of the two villages. With the exception of the genetic polymorphism level, the high endemic village indicated higher proportions on all variables. The *Anopheles* sp intra population genetic Polymorphism Indeces were equally relatively high in both villages (≥ 90%), but with a low inter population Similarity Index. It was, therefore, concluded that the higher malaria endemicity in the high endemic area of the Kokap Sub-District was related to the higher vectoral competence, infectivity, relative abundance, age structure, and anthrophilic behavior in the local *Anopheles* sp population.

Key words: *Anopheles* spp, vectoral competence, infectivity, endemicity, genetic polymorphism