

ANALISIS SPASIAL KEJADIAN MALARIA DAN IDENTIFIKASI SPESIES KEMBAR *ANOPHELES BARBIROSTRIS* DI DESA LIFULEO KECAMATAN KUPANG BARAT

Hanani Melangwala Laumalay¹, Tri Baskoro Tunggul Satoto¹, Anis Fuad²

¹Magister Ilmu Kedokteran Tropis, Fakultas Kedokteran, Kesehatan Masyarakat, dan Keperawatan, Universitas Gadjah Mada Yogyakarta

²Magister Ilmu Kesehatan Masyarakat, Fakultas Kedokteran, Kesehatan Masyarakat, dan Keperawatan, Universitas Gadjah Mada Yogyakarta
Email: hananilaumalay@gmail.com

INTISARI

Latar belakang: *Annual parasite Incidenci* (API) di Desa Lifuleo sebesar 7,07⁰/₁₀₀ tahun 2015. Pengendalian malaria melalui pengobatan dan penggunaan kelambu belum berhasil menurunkan angka kesakitan. *Anopheles barbirostris* ditemukan mengisap darah manusia sepanjang hari di Desa Lifuleo, hal ini mengindikasikan adanya spesies kembar. Upaya pengendalian malaria dipengaruhi spesies kembar, karakteristik habitat perkembangbiakan, keragaman spesies dan perilaku nyamuk vektor. Tujuan penelitian adalah mempelajari kejadian malaria secara spasial dan mengidentifikasi spesies kembar *Anopheles barbirostris*.

Metode: Observasional analitik dengan rancangan *Cross Sectional* digunakan untuk mempelajari bionomik *Anopheles* spp, spesies kembar *An. barbirostris* dan kejadian malaria secara spasial. Subyek penelitian yaitu kasus malaria, *Anopheles* spp serta habitat perkembangbiakannya. Penderita malaria (tahun 2014-2017) dan habitat perkembangbiakan diambil secara total sampling sedangkan sampel *Anopheles* spp secara random melalui survei nyamuk dan jentik. Variabel penelitian adalah kejadian malaria, keragaman spesies, waktu mengisap darah, tempat mengisap darah, perilaku istirahat *Anopheles* spp, spesies kembar *An. barbirostris*, jenis habitat perkembangbiakan, flora, fauna, kepadatan jentik, kadar garam, pH, dan jarak habitat perkembangbiakan. Analisis data dilakukan secara univariat, dan multivariat menggunakan *Indeks moran I*, *Spatial Error Model*, *buffering*, dan *filogenik tree* dengan pendekatan *maximum likelihood* (kimura2).

Hasil: Penderita malaria di Desa Lifuleo sebanyak 14 orang, laki-laki (71,4%) dan perempuan (28,6%). Jenis Plasmodium yang ditemukan yaitu *P. falciparum* dan *P. vivax*. Proporsi *P.vivax* (57,1%) sedikit lebih tinggi dari *P.falciparum* (42,9%). Kadar garam pada habitat berkisar 0-71⁰/₁₀₀. Derajat keasaman (pH) habitat berkisar antara 5,2-9,4. Spesies *Anopheles* tertangkap yaitu *Anopheles barbirostris*, *An. subpictus*, *An. umbrosus*, *An.vagus*, *An. vagus var limosus* dan *An. indefinitus*. *Anopheles barbirostris* dan *An. subpictus* mengisap darah manusia

sepanjang hari. Ditemukan perbedaan urutan basa kedua dari *An. barbirostris* yaitu “A” dan “C”. Model dari Analisis multivariate hubungan bionomik habitat adalah $\hat{Y} = 0.693868 - 0.248202 (X1) + 0.247702 (X2) + 0.280063 (X6) + u$ dengan $u = -0.606017Wu + \varepsilon$

Kesimpulan: Penderita malaria di Desa Lifuleo mengelompok di sekitar habitat *Anopheles* spp. *Anopheles barbirostris* di Desa Lifuleo merupakan spesies *out group* sekaligus spesies kembar *sympatric*.

Kata kunci: malaria, spasial, spesies kembar *Anopheles barbirostris*.

SPATIAL ANALYSIS MALARIA INCIDENCE AND IDENTIFICATION OF SIBLING SPECIES *ANOPHELES BARBIROSTRIS* IN THE VILLAGE OF LIFULEO SUB-DISTRICT KUPANG WEST

Hanani Melangwala Laumalay¹, Tri Baskoro Tunggul Satoto¹, Anis Fuad²

¹ Master of Science in Tropical Medicine, Faculty of medicine, public health,
nursing, and the University of Gadjah Mada Yogyakarta

² Master of Public Health Sciences, Faculty of medicine, public health, nursing,
and the University of Gadjah Mada Yogyakarta
Email: hananilaumalay@gmail.com

ABSTRACT

Background: Annual parasite Incidenci (API) in Lifuleo Village is 7.07 ‰ in 2015. Malaria control through treatment and use of mosquito nets has not succeeded in reducing morbidity. *Anopheles barbirostris* is found to human biting the day in Lifuleo Village, this indicates the presence of sibling species. Efforts to control malaria are affected by sibling species, characteristics of breeding habitats, species diversity and vector mosquito behavior. The aim of the study was incidence of malaria spatially and identify sibling species of *Anopheles barbirostris*.

Method: Analytical observational with Cross Sectional design was used to study *Anopheles* spp bionomics, sibling species *An. barbirostris* and spatial malaria incidence. The research subjects were malaria cases, *Anopheles* spp and their breeding habitat. Malaria cases (2014-2017) and breeding habitats were taken in total sampling while the *Anopheles* spp samples were randomized through mosquito and larvae surveys. The research variables were malaria incidence, species diversity, biting time, biting location, resting behavior of *Anopheles* spp, sibling species *An. barbirostris*, breeding habitat types, flora, fauna, larvae density, salinity, pH, and breeding habitat range. Data analysis was carried out by univariate, and multivariate using Moran I Index, Spatial Error Model, buffering, and phylogeny tree with maximum likelihood approach (Kimura2).

Results: Malaria cases in the village of Lifuleo were 14 people, men (71.4%) and women (28.6%). *Plasmodium* types found were *P. falciparum* and *P. vivax*. The proportion of *P. vivax* (57.1%) was slightly higher than *P. falciparum* (42.9%). Salt levels in habitats range from 0-71 ‰. The degree of acidity (pH) habitat ranges between 5.2-9.4. *Anopheles* species caught are *Anopheles barbirostris*, *An. subpictus*, *An. umbrosus*, *An. vagus*, *An. vagus var limosus* and *An. indefinitus*. *Anopheles barbirostris* and *An. subpictus* biting human throughout the day. Differences in the second base sequence from *An. barbirostris* namely "A" and "C". The model of multivariate analysis of the relationship of habitat bionomics is

$$\hat{Y} = 0.693868 - 0.248202 (X1) + 0.247702 (X2) + 0.280063 (X6) + u \text{ with } u = -0.606017Wu + \varepsilon.$$

Conclusion: Malaria cases in Lifuleo Village cluster around *Anopheles* spp habitat. *Anopheles barbirostris* in the village of Lifuleo is a species out group and sibling species sympatric.

Keywords: malaria, spatial, sibling species *Anopheles barbirostris*.