ANALISIS PERBEDAAN HASIL PENGAMATAN JUMLAH *Plasmodium* PADA PREPARAT YANG DIWARNAI GIEMSA 3% DENGAN PELARUT BUFFER FOSFAT DAN AQUADEST

ABSTRAK

Latar Belakang: Pemeriksaan mikroskopis merupakan metode utama dalam diagnosis malaria untuk mendeteksi parasit *Plasmodium* dalam darah. Kualitas hasil dipengaruhi oleh pewarnaan Giemsa, khususnya jenis pelarut yang digunakan. Buffer fosfat mampu menjaga kestabilan pH sehingga menghasilkan pewarnaan optimal, sedangkan aquadest sering digunakan sebagai alternatif karena mudah diperoleh meskipun tidak memiliki sistem penyangga pH.
Tujuan: Mengetahui perbedaan hasil pengamatan jumlah *Plasmodium* pada preparat darah yang diwarnai Giemsa 3% dengan pelarut buffer fosfat dan aquadest.
Metode: Penelitian eksperimental dengan desain *Intact Group Comparison* yang dilakukan di Puskesmas Gedongtengen Yogyakarta pada 02 Januari– 26 Maret 2026. Sampel berupa 32 preparat darah malaria, terdiri dari 16 menggunakan buffer fosfat dan 16 aquadest. Pengamatan dilakukan secara mikroskopis untuk menilai kualitas pewarnaan dan menghitung jumlah Plasmodium. Analisis menggunakan uji *Shapiro-Wilk* dan *Mann-Whitney U*.
Hasil: Rata-rata jumlah *Plasmodium* pada pelarut buffer fosfat sebesar 4,673 dan aquadest 4,493 dengan selisih 4,0%. Uji statistik menunjukkan $p < 0,05$, yang berarti terdapat perbedaan. Buffer fosfat menghasilkan pewarnaan lebih jelas dan kontras dibandingkan aquadest.
Kesimpulan: Terdapat perbedaan antara penggunaan buffer fosfat dan aquadest. Buffer fosfat lebih optimal, namun aquadest masih dapat digunakan sebagai alternatif. Hasil mendukung penggunaan buffer fosfat sebagai standar pemeriksaan malaria mikroskopis rutin.

Kata Kunci: malaria, *Plasmodium*, pewarnaan Giemsa, konsentrasi, pelarut.

ANALYSIS OF DIFFERENCES IN THE OBSERVED NUMBER OF *Plasmodium* ON BLOOD SMEARS STAINED WITH 3% GIEMSA USING PHOSPHATE BUFFER AND AQUADEST AS DILUENTS

ABSTRACT

Background: Microscopic examination is the primary method for diagnosing malaria by detecting *Plasmodium* parasites in blood. The quality of results is influenced by Giemsa staining, particularly the type of solvent used. Phosphate buffer can maintain pH stability, resulting in optimal staining, while distilled water (aquadest) is often used as an alternative due to its availability, although it lacks a buffering system.

Objective: To determine the difference in the observed number of *Plasmodium* in blood smears stained with 3% Giemsa using phosphate buffer and distilled water (aquadest) as solvents.

Methods: This was an experimental study with an Intact Group Comparison design conducted at Gedongtengen Public Health Center, Yogyakarta, from 02 January to 26 March 2026. The sample consisted of 32 malaria blood smears, with 16 prepared using phosphate buffer and 16 using distilled water. Observations were carried out microscopically to assess staining quality and to count the number of *Plasmodium*. Data were analyzed using the Shapiro–Wilk test and the Mann–Whitney U test.

Results: The mean number of Plasmodium using phosphate buffer was 4.673, while distilled water showed 4.493, with a difference of 4.0%. Statistical analysis showed $p < 0.05$, indicating a difference. Phosphate buffer produced clearer and more contrasted staining compared to distilled water.

Conclusion: There is a significant difference between the use of phosphate buffer and distilled water. Phosphate buffer is more optimal; however, distilled water can still be used as an alternative. These findings support the use of phosphate buffer as the standard solvent in routine microscopic malaria examinations.

Keywords: malaria, *Plasmodium*, Giemsa staining, concentration, solvent..