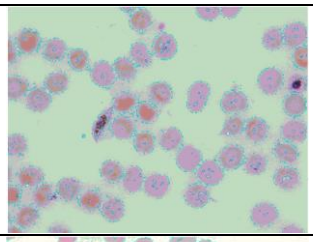
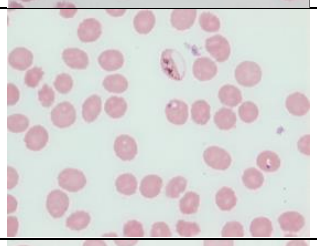
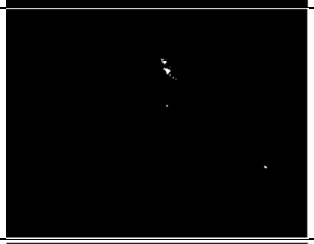
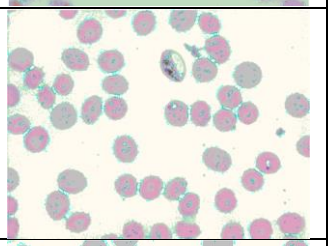
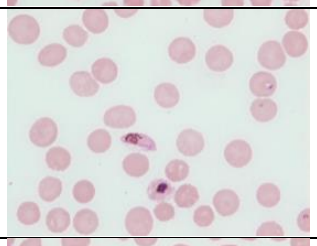
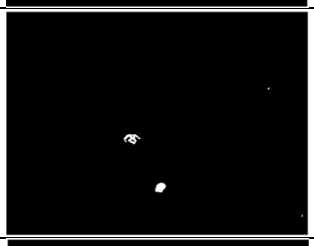
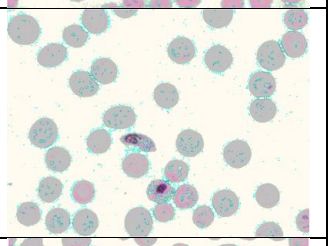
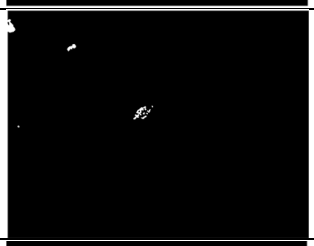
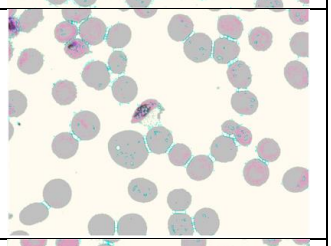
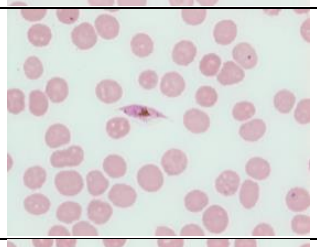
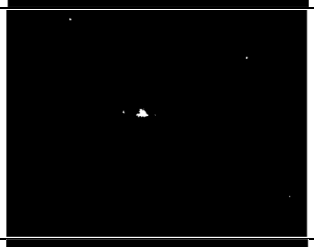
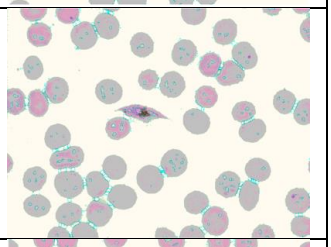
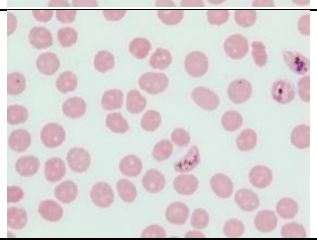
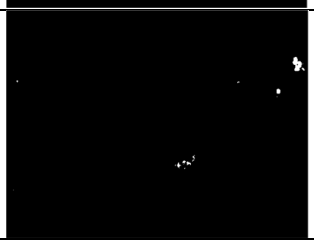
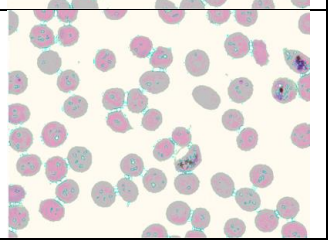
# LAMPIRAN

## 1. Lampiran A Hasil Segmentasi

a. Plasmodium *Falciparum*

| No | Citra Plasmodium Falciparum | Citra Asli | Citra Segmentasi Thresholding | Citra Segmentasi Watershed |
|---|---|---|---|---|
| 1 | Image 7 |  |  |  |
| 2 | Image 52 |  |  |  |
| 3 | Image 104 |  |  |  |
| 4 | Image 108 |  |  |  |
| 5 | Image 128 |  |  |  |
| 6 | Image 147 |  |  |  |

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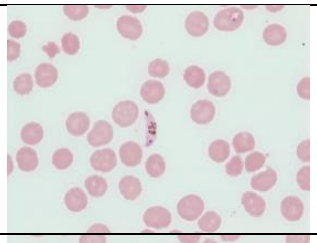
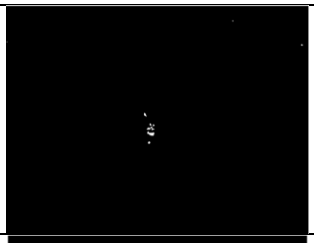
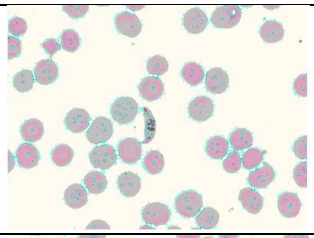
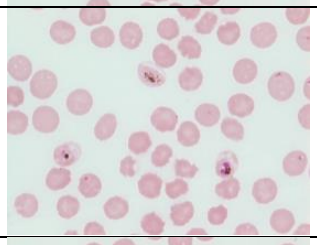
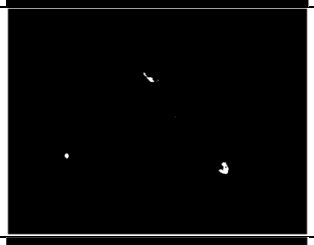
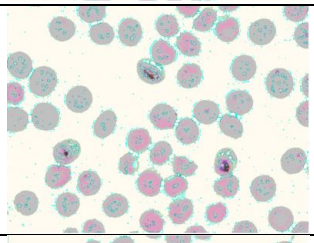
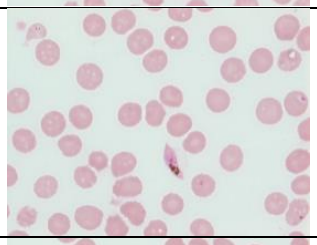
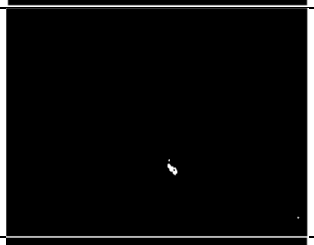
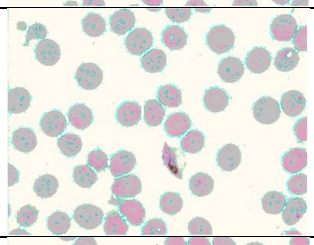
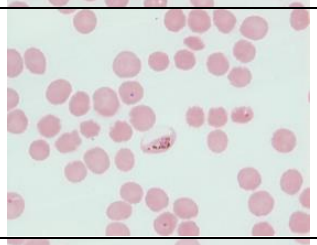
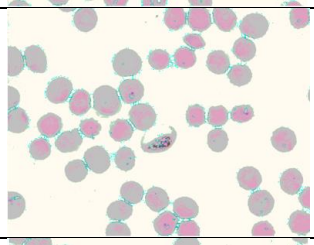
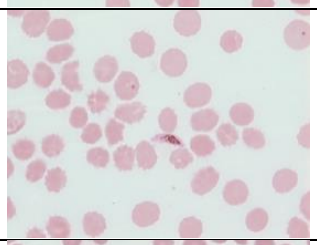
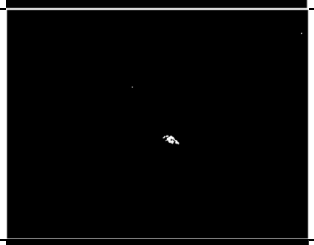
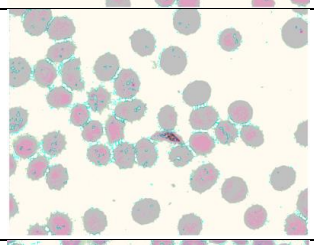
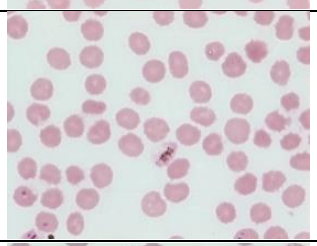
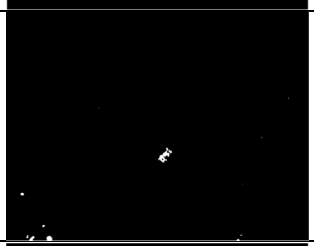
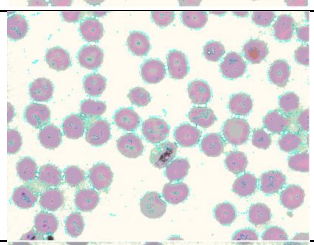
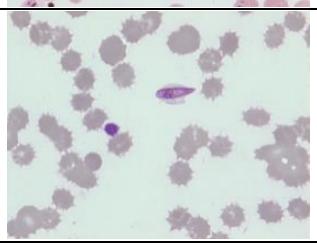
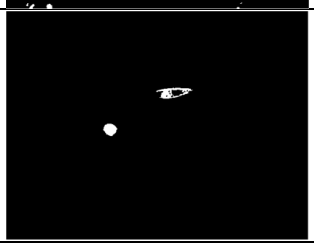
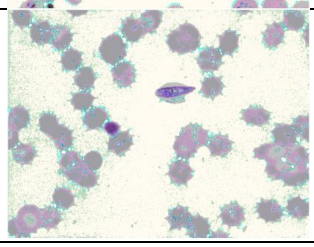
| 7 | Image 149 |  |  |  |
| 8 | Image 170 |  |  |  |
| 9 | Image 171 |  |  |  |
| 10 | Image 177 |  |  |  |
| 11 | Image 181 |  |  |  |
| 12 | Image 190 |  |  |  |
| 13 | Image 243 |  |  |  |

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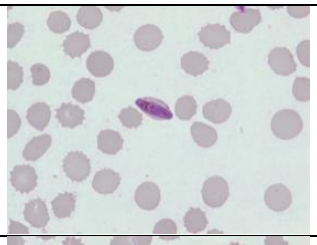
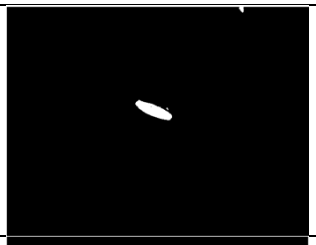
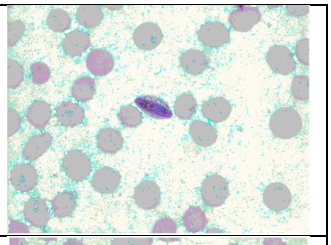
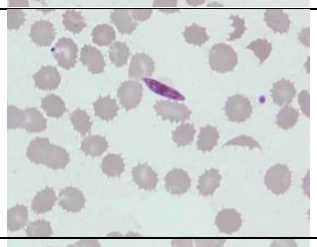
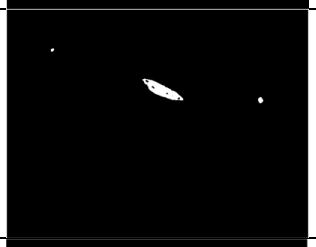
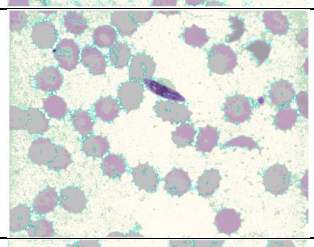
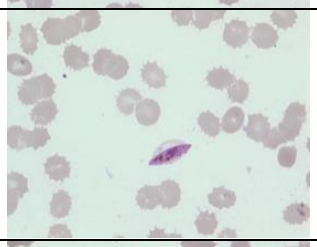
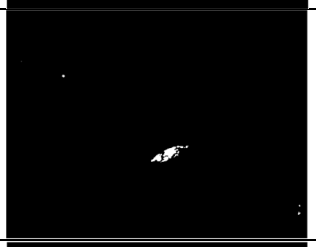
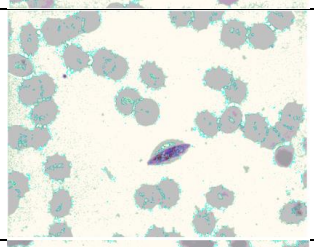
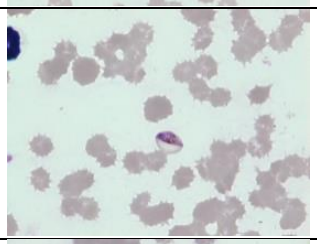
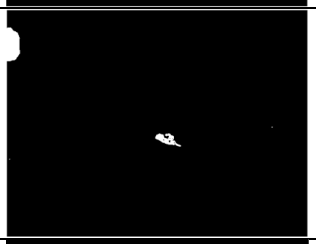
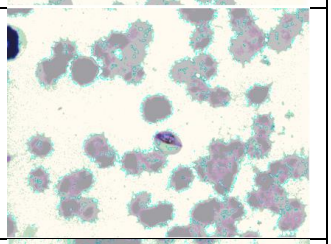
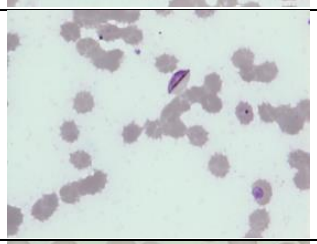
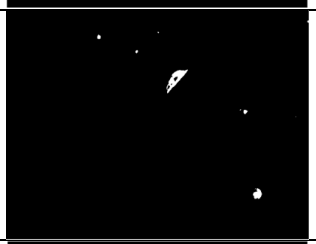
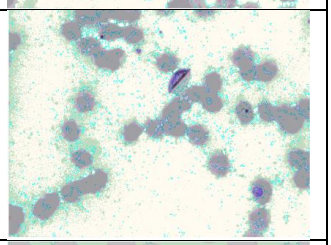
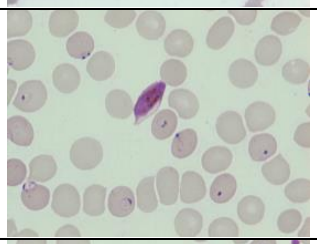
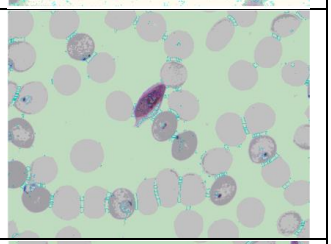
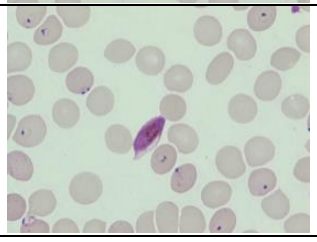
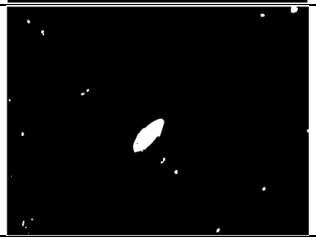
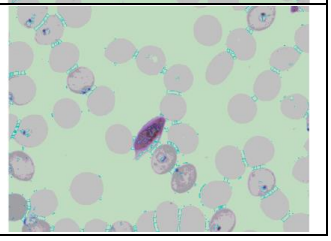
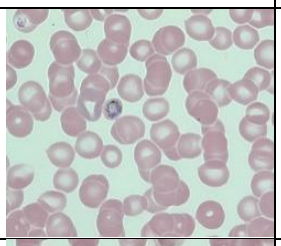
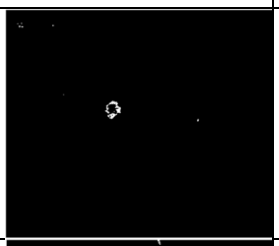
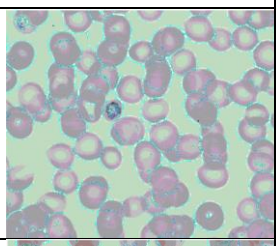
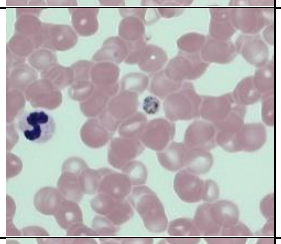
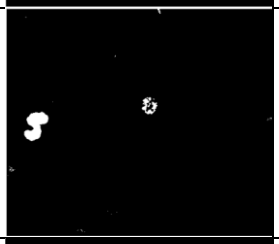
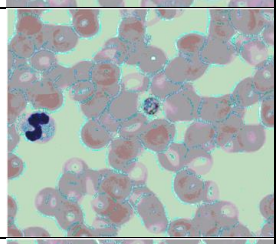
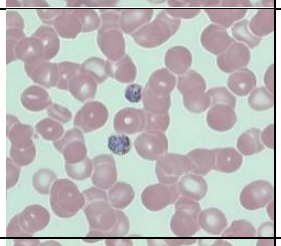
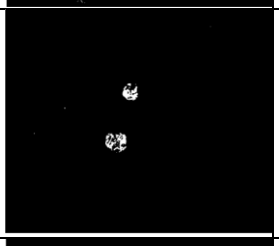
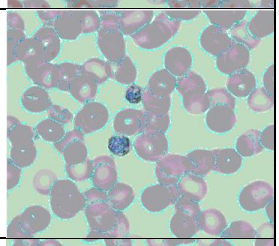
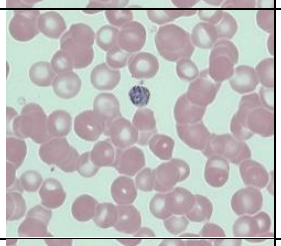
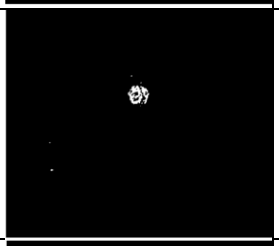
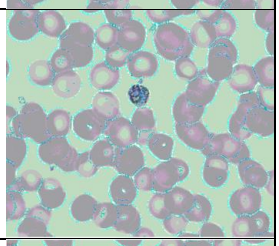
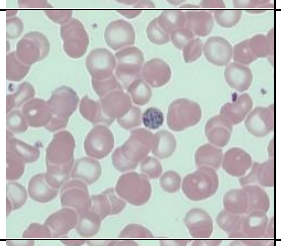
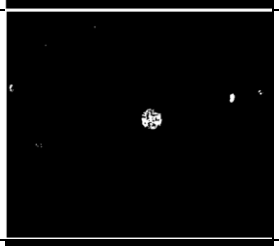
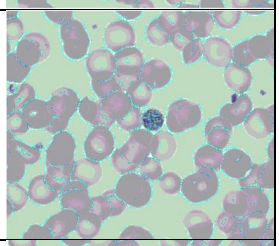
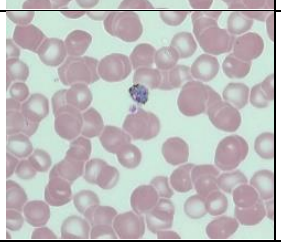
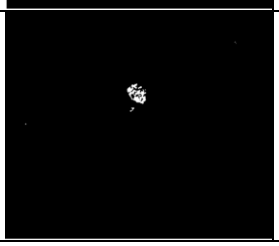
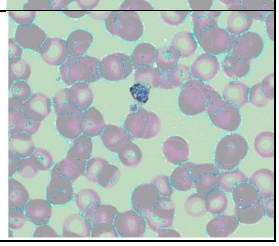
| 14 | Image 245 |  |  |  |
| 15 | Image 246 |  |  |  |
| 16 | Image 259 |  |  |  |
| 17 | Image 271 |  |  |  |
| 18 | Image 274 |  |  |  |
| 19 | Image 302 |  |  |  |
| 20 | Image 303 |  |  |  |

b. Plasmodium Malaria

| No | Citra Plasmodium Malaria | Citra Asli | Citra Segmentasi Thresholding | Citra Segmentasi Watershed |
|---|---|---|---|---|
| 1 | Image 288 |  |  |  |
| 2 | Image 289 |  |  |  |
| 3 | Image 290 |  |  |  |
| 4 | Image 291 |  |  |  |
| 5 | Image 292 |  |  |  |
| 6 | Image 293 |  |  |  |

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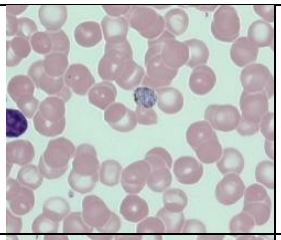
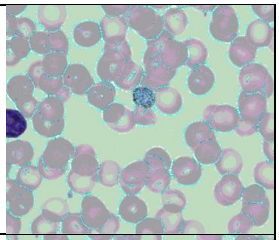
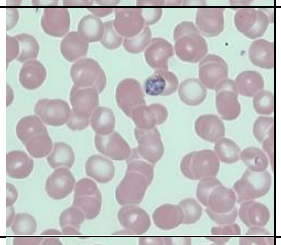
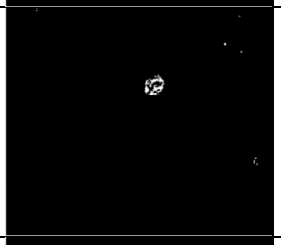
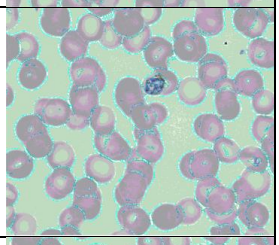
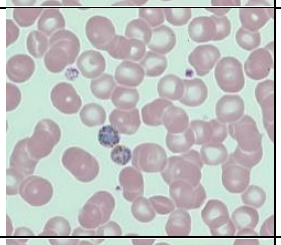
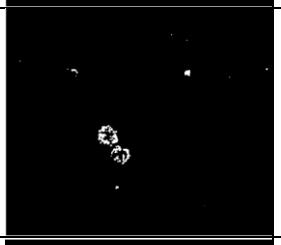
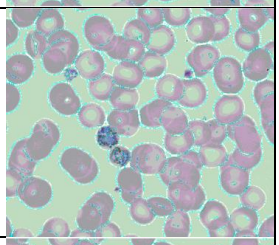
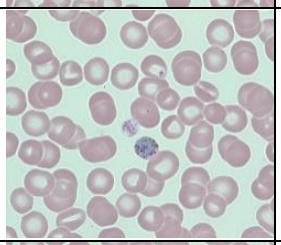
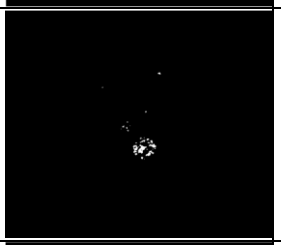
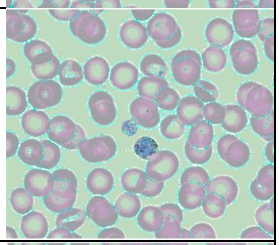
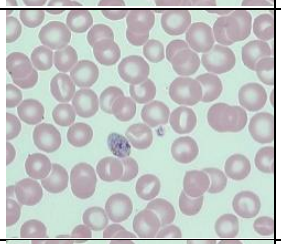
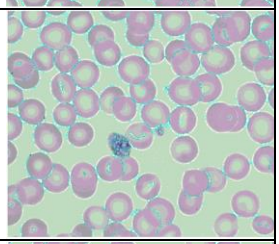
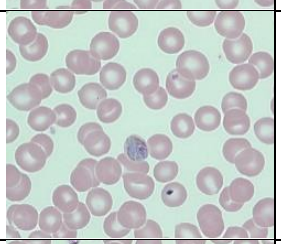
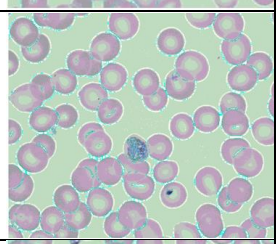
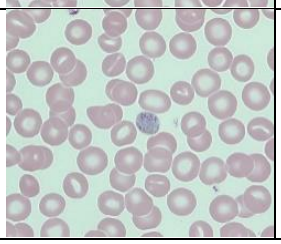
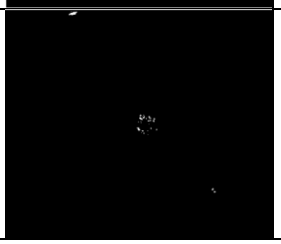
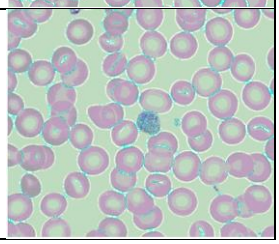
| 7 | Image 294 |  |  |  |
| 8 | Image 295 |  |  |  |
| 9 | Image 296 |  |  |  |
| 10 | Image 297 |  |  |  |
| 11 | Image 298 |  |  |  |
| 12 | Image 299 |  |  |  |
| 13 | Image 300 |  |  |  |

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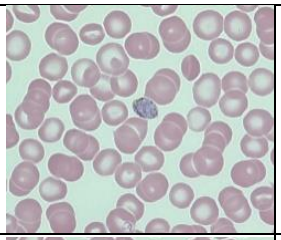
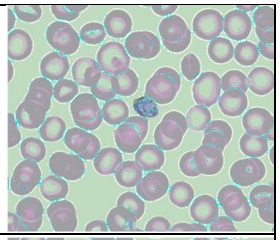
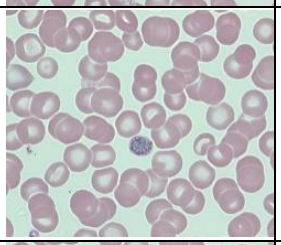
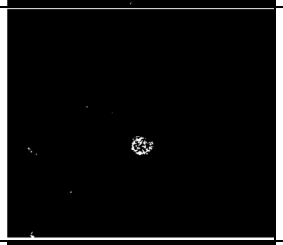
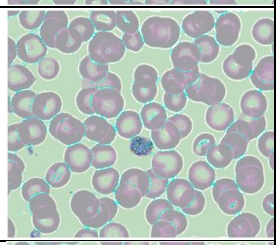
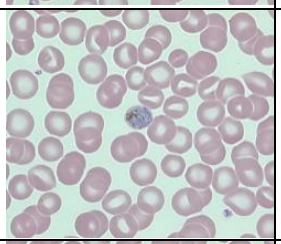
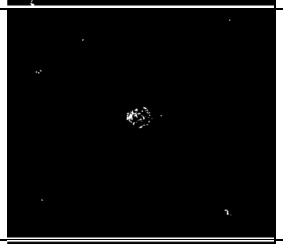
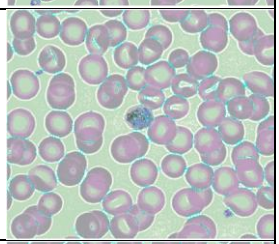
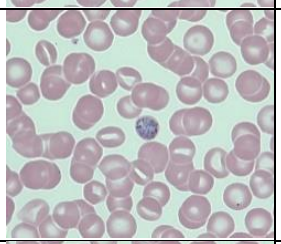
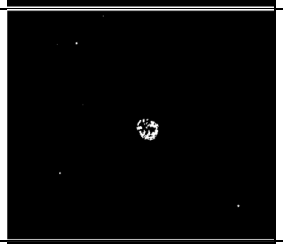
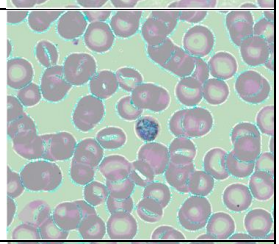
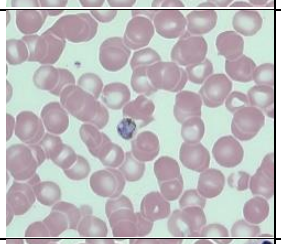
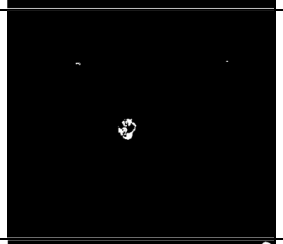
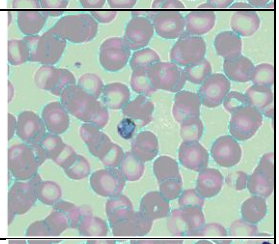
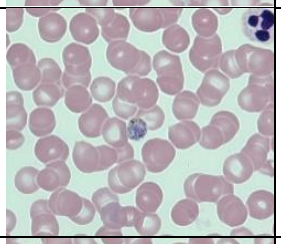
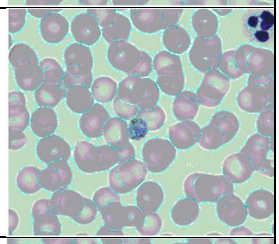
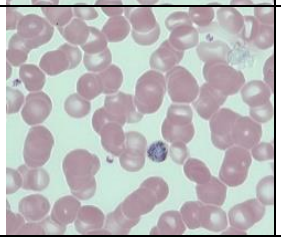
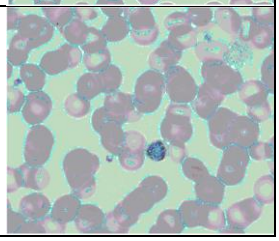
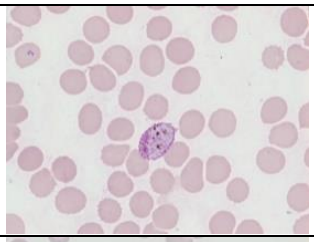
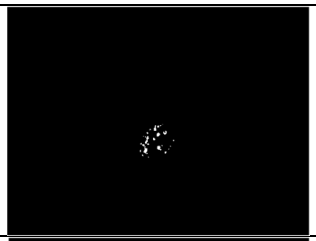
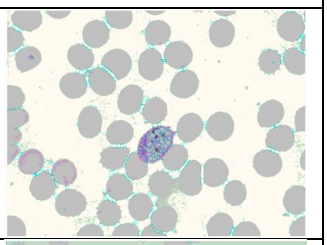
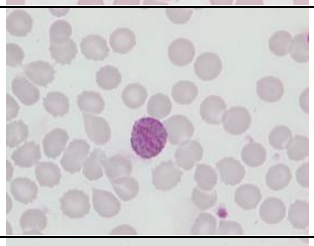
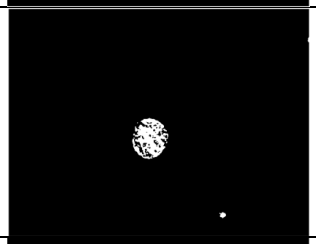
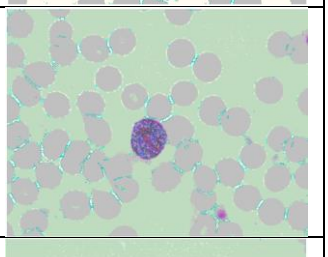
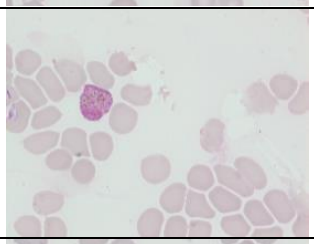
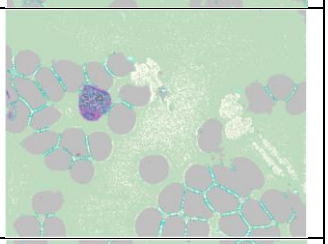
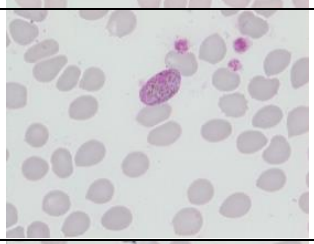
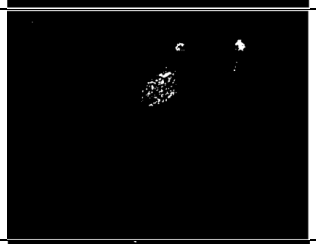
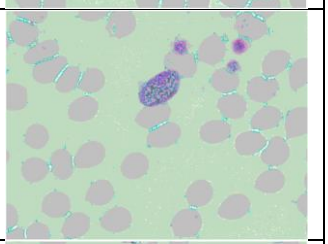
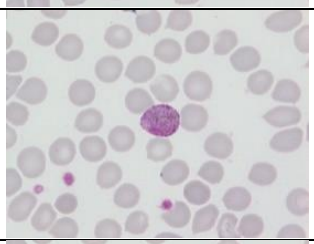
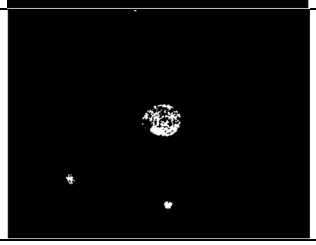
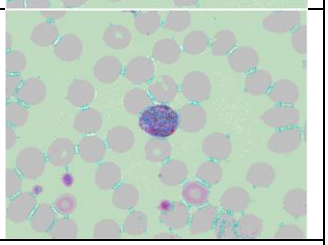
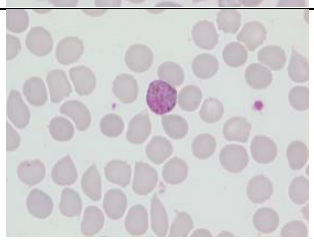
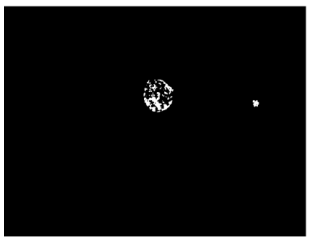
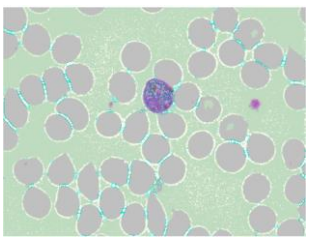
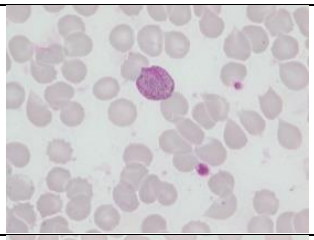
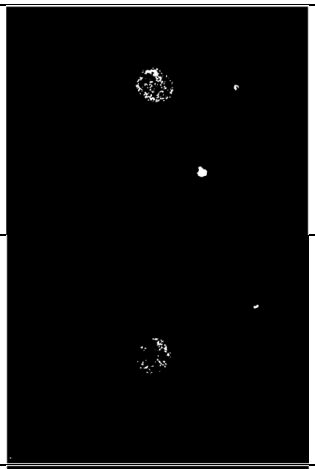
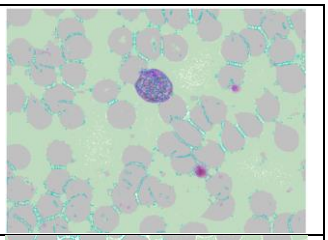
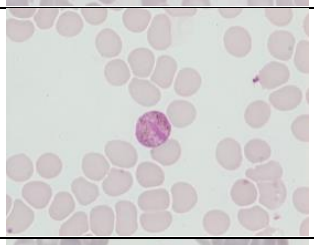
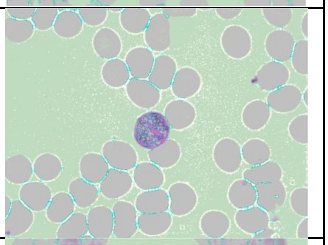
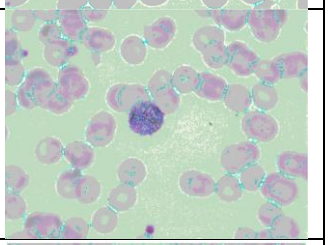
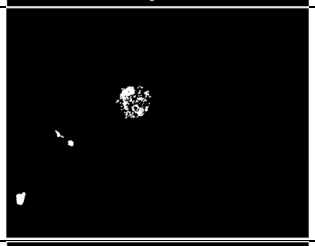
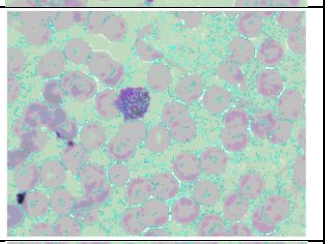
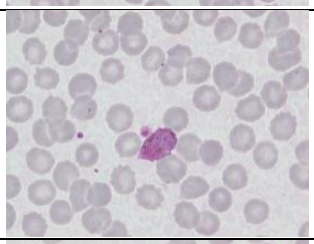
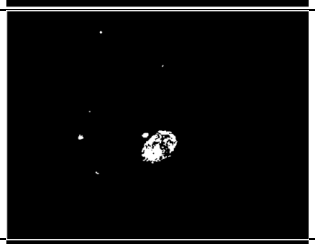
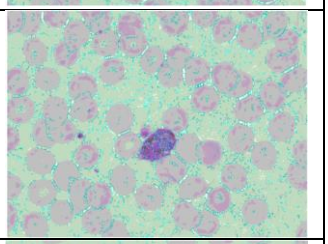
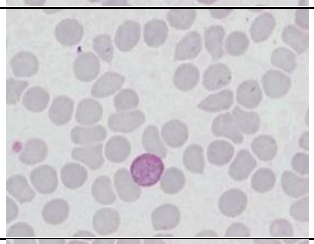
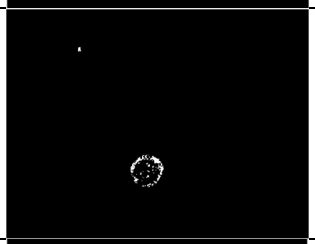
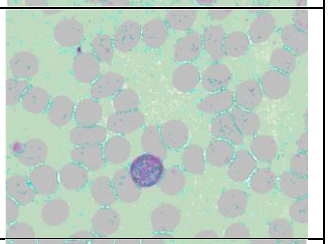
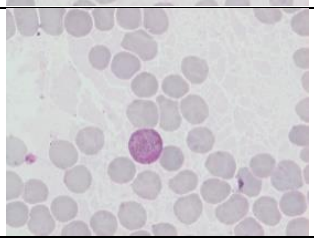
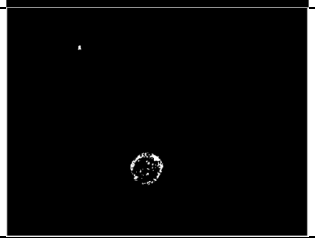
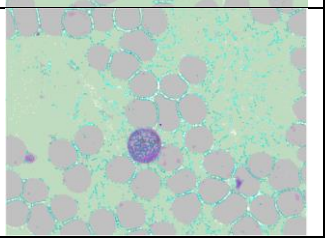
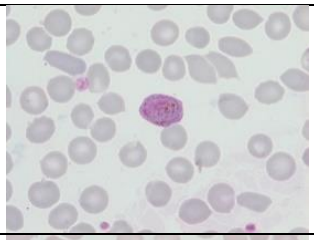
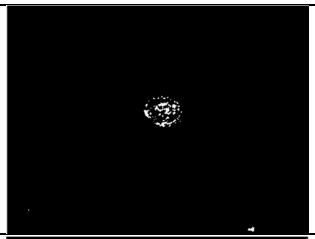
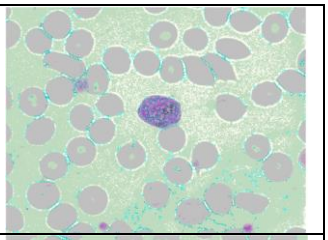
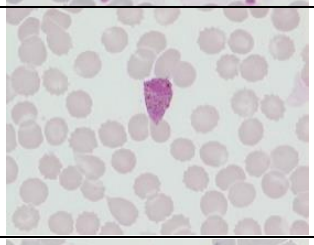
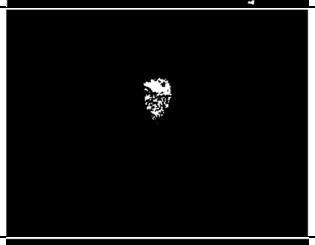
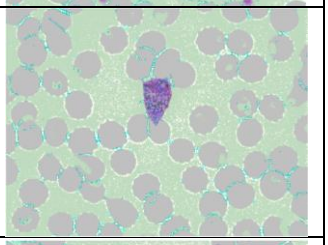
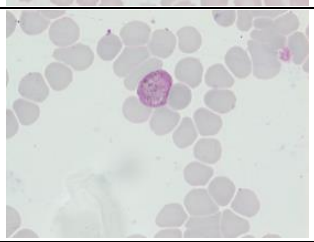
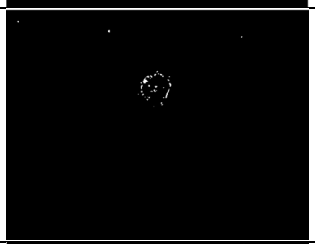
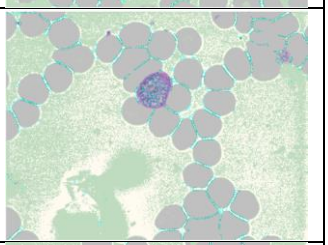
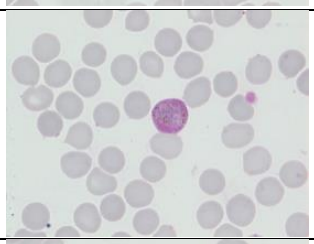
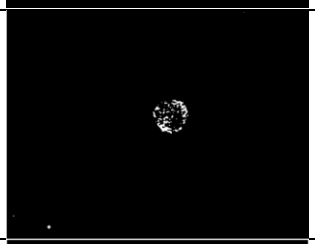
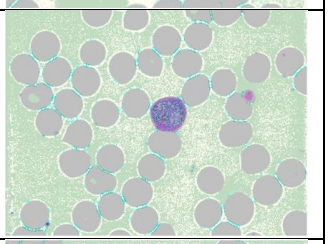
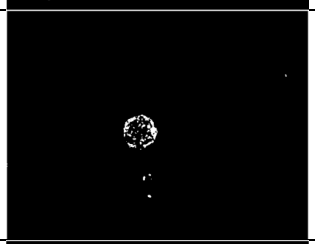
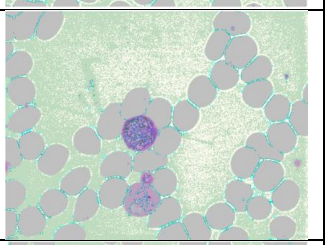
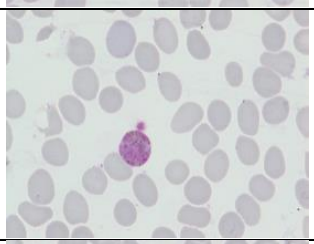
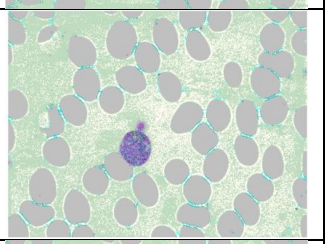
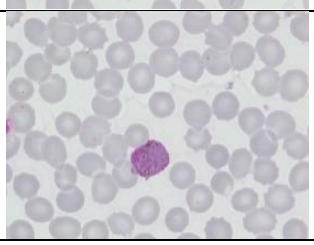
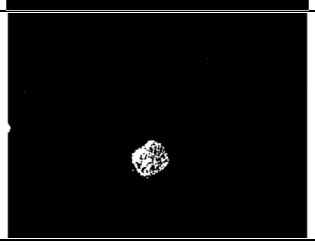
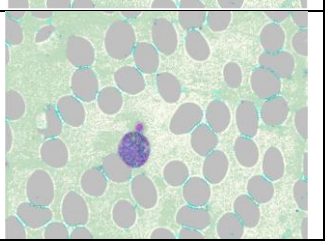
| 14 | Image 301 |  |  |  |
| 15 | Image 302 |  |  |  |
| 16 | Image 303 |  |  |  |
| 17 | Image 304 |  |  |  |
| 18 | Image 305 |  |  |  |
| 19 | Image 306 |  |  |  |
| 20 | Image 307 |  |  |  |

c. Plasmodium *Vivax*

| No | Citra Plasmodium Vivax | Citra Asli | Citra Segmentasi Thresholding | Citra Segmentasi Watershed |
|---|---|---|---|---|
| 1 | Image 498 |  |  |  |
| 2 | Image 505 |  |  |  |
| 3 | Image 509 |  |  |  |
| 4 | Image 513 |  |  |  |
| 5 | Image 522 |  |  |  |
| 6 | Image 524 |  |  |  |

| | | | | |
|---|---|---|---|---|
| 7 | Image 525 |  |  |  |
| 8 | Image 530 |  | |  |
| 9 | Image 534 |  | |  |
| 10 | Image 541 |  |  |  |
| 11 | Image 542 |  |  |  |
| 12 | Image 544 |  |  |  |
| 13 | Image 545 |  |  |  |

| | | | | |
|---|---|---|---|---|
| 14 | Image 547 |  |  |  |
| 15 | Image 552 |  |  |  |
| 16 | Image 553 |  |  |  |
| 17 | Image 558 |  |  |  |
| 18 | Image 560 |  |  |  |
| 19 | Image 561 |  |  |  |
| 20 | Image 564 |  |  |  |

## 2. Lampiran B (Kualitatif)

Tabel Data Kebenaran Hasil Uji Citra plasmodium

a. Plasmodium Falciparum

| NO | Citra Plasmodium Falciparum | Algoritma Thresholding | | Algoritma Wateshed | |
|---|---|---|---|---|---|
| | | Benar | Salah | Benar | Salah |
| 1 | Image 7 | ✓ | | ✓ | |
| 2 | Image 52 | ✓ | | ✓ | |
| 3 | Image 104 | ✓ | | ✓ | |
| 4 | Image 108 | ✓ | | ✓ | |
| 5 | Image 128 | ✓ | | ✓ | |
| 6 | Image 147 | ✓ | | ✓ | |
| 7 | Image 149 | ✓ | | ✓ | |
| 8 | Image 170 | ✓ | | ✓ | |
| 9 | Image 171 | ✓ | | ✓ | |
| 10 | Image 177 | ✓ | | ✓ | |
| 11 | Image 181 | ✓ | | | ✓ |
| 12 | Image 190 | ✓ | | | ✓ |
| 13 | Image 243 | ✓ | | ✓ | |
| 14 | Image 245 | ✓ | | ✓ | |
| 15 | Image 246 | ✓ | | ✓ | |
| 16 | Image 259 | ✓ | | ✓ | |
| 17 | Image 271 | ✓ | | ✓ | |
| 18 | Image 274 | ✓ | | ✓ | |
| 19 | Image 302 | ✓ | | ✓ | |
| 20 | Image 303 | ✓ | | ✓ | |

b. Plasmodium Malaria

| NO | Citra Plasmodium Malaria | Algoritma Thresholding | | Algoritma Wateshed | |
|---|---|---|---|---|---|
| | | Benar | Salah | Benar | Salah |
| 1 | Image 288 | ✓ | | ✓ | |
| 2 | Image 289 | ✓ | | ✓ | |
| 3 | Image 290 | ✓ | | ✓ | |
| 4 | Image 291 | ✓ | | ✓ | |
| 5 | Image 292 | ✓ | | ✓ | |
| 6 | Image 293 | ✓ | | ✓ | |
| 7 | Image 294 | ✓ | | ✓ | |
| 8 | Image 295 | ✓ | | ✓ | |
| 9 | Image 296 | ✓ | | ✓ | |
| 10 | Image 297 | ✓ | | ✓ | |
| 11 | Image 298 | ✓ | | ✓ | |
| 12 | Image 299 | ✓ | | ✓ | |

| | | | | | |
|---|---|---|---|---|---|
| 13 | Image 300 | ✓ | | ✓ | |
| 14 | Image 301 | ✓ | | ✓ | |
| 15 | Image 302 | ✓ | | ✓ | |
| 16 | Image 303 | ✓ | | ✓ | |
| 17 | Image 304 | ✓ | | ✓ | |
| 18 | Image 305 | ✓ | | ✓ | |
| 19 | Image 306 | ✓ | | ✓ | |
| 20 | Image 307 | ✓ | | ✓ | |

c. Plasmodium *Vivax*

| NO | Citra Plasmodium Vivax | Algoritma *Thresholding* | | Algoritma W*atershed* | |
|---|---|---|---|---|---|
| | | Benar | Salah | Benar | Salah |
| 1 | Image 498 | ✓ | | ✓ | |
| 2 | Image 505 | ✓ | | ✓ | |
| 3 | Image 509 | ✓ | | ✓ | |
| 4 | Image 513 | ✓ | | ✓ | |
| 5 | Image 522 | ✓ | | ✓ | |
| 6 | Image 524 | ✓ | | ✓ | |
| 7 | Image 525 | ✓ | | ✓ | |
| 8 | Image 530 | ✓ | | ✓ | |
| 9 | Image 534 | ✓ | | ✓ | |
| 10 | Image 541 | ✓ | | ✓ | |
| 11 | Image 542 | ✓ | | ✓ | |
| 12 | Image 544 | ✓ | | ✓ | |
| 13 | Image 545 | ✓ | | ✓ | |
| 14 | Image 547 | ✓ | | ✓ | |
| 15 | Image 552 | ✓ | | ✓ | |
| 16 | Image 553 | ✓ | | ✓ | |
| 17 | Image 558 | ✓ | | ✓ | |
| 18 | Image 560 | ✓ | | ✓ | |
| 19 | Image 561 | ✓ | | ✓ | |
| 20 | Image 564 | ✓ | | ✓ | |

## 3. Lampiran C (Kuantitatif)

A. Data akurasi sistem

| Jenis Citra | Akurasi (Benar/Total P * 100%*100) | |
|---|---|---|
| | Thresholding | Watershed |
| Plasmodium Falciparum | 100 | 90 |
| Plasmodium Malaria | 100 | 90 |
| Plasmodium Vivax | 100 | 90 |

B. Waktu Komputasi Plasmodium *Falciparum*

| NO | Citra Plasmodium Falciparum | Lama Waktu Eksekusi (s) | |
|---|---|---|---|
| | | Thresholding | Watershed |
| 1 | Image 7 | 1,5 | 4 |
| 2 | Image 52 | 1,7 | 3,8 |
| 3 | Image 104 | 1,9 | 3,9 |
| 4 | Image 108 | 1,5 | 3,9 |
| 5 | Image 128 | 1,8 | 3,7 |
| 6 | Image 147 | 1,7 | 3,8 |
| 7 | Image 149 | 1,8 | 3,8 |
| 8 | Image 170 | 1,7 | 4 |
| 9 | Image 171 | 1,7 | 4 |
| 10 | Image 177 | 1,5 | 3,8 |
| 11 | Image 181 | 1,6 | 3,8 |
| 12 | Image 190 | 1,7 | 3,9 |
| 13 | Image 243 | 1,6 | 4 |
| 14 | Image 245 | 1,4 | 3,9 |
| 15 | Image 246 | 1,6 | 3,8 |
| 16 | Image 259 | 1,6 | 3,9 |
| 17 | Image 271 | 1,5 | 3,8 |
| 18 | Image 274 | 1,7 | 3,9 |
| 19 | Image 302 | 1,6 | 4 |
| 20 | Image 303 | 1,6 | 3,7 |
| | RATA - RATA | 1,64 | 3,87 |
| | STANDAR DEVIASI | 0,12 | 0,10 |

C. Waktu Komputasi Plasmodium Malaria

| NO | Citra Plasmodium Malaria | Lama Waktu Eksekusi (s) | |
|---|---|---|---|
| | | Thresholding | Watershed |
| 1 | Image 288 | 1,6 | 3,9 |
| 2 | Image 289 | 1,6 | 3,9 |
| 3 | Image 290 | 1,6 | 4 |
| 4 | Image 291 | 1,5 | 3,9 |
| 5 | Image 292 | 1,7 | 4,2 |
| 6 | Image 293 | 1,6 | 4 |
| 7 | Image 294 | 1,6 | 4 |
| 8 | Image 295 | 1,5 | 4 |
| 9 | Image 296 | 1,5 | 4,2 |
| 10 | Image 297 | 1,5 | 3,8 |
| 11 | Image 298 | 1,7 | 3,8 |
| 12 | Image 299 | 1,5 | 3,8 |
| 13 | Image 300 | 1,6 | 3,9 |
| 14 | Image 301 | 1,5 | 3,9 |
| 15 | Image 302 | 1,5 | 3,8 |
| 16 | Image 303 | 1,5 | 3,8 |
| 17 | Image 304 | 1,6 | 3,9 |
| 18 | Image 305 | 1,5 | 3,8 |
| 19 | Image 306 | 1,5 | 3,8 |
| 20 | Image 307 | 1,5 | 3,8 |
| | RATA - RATA | 1,56 | 3,91 |
| | STANDAR DEVIASI | 0,07 | 0,13 |

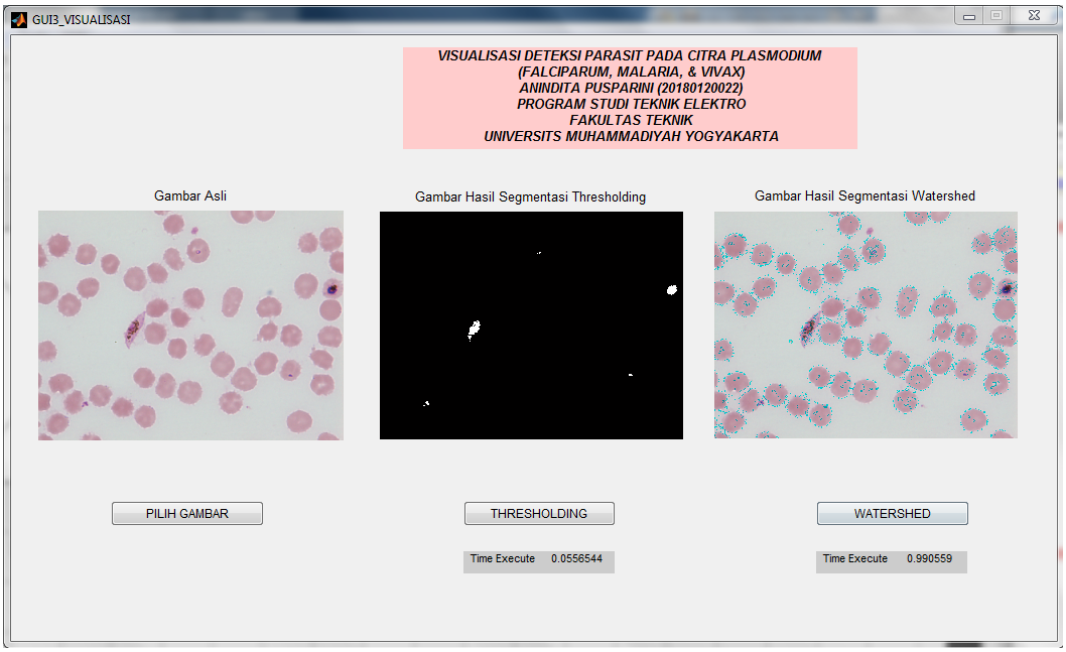
D. Waktu Komputasi Plasmodium *Vivax*

| NO | Citra Plasmodium Malaria | Lama Waktu Eksekusi (s) | |
|---|---|---|---|
| | | Thresholding | Watershed |
| 1 | Image 288 | 1,6 | 3,9 |
| 2 | Image 289 | 1,6 | 3,9 |
| 3 | Image 290 | 1,6 | 4 |
| 4 | Image 291 | 1,5 | 3,9 |
| 5 | Image 292 | 1,7 | 4,2 |
| 6 | Image 293 | 1,6 | 4 |
| 7 | Image 294 | 1,6 | 4 |
| 8 | Image 295 | 1,5 | 4 |
| 9 | Image 296 | 1,5 | 4,2 |
| 10 | Image 297 | 1,5 | 3,8 |
| 11 | Image 298 | 1,7 | 3,8 |
| 12 | Image 299 | 1,5 | 3,8 |
| 13 | Image 300 | 1,6 | 3,9 |
| 14 | Image 301 | 1,5 | 3,9 |
| 15 | Image 302 | 1,5 | 3,8 |
| 16 | Image 303 | 1,5 | 3,8 |
| 17 | Image 304 | 1,6 | 3,9 |
| 18 | Image 305 | 1,5 | 3,8 |
| 19 | Image 306 | 1,5 | 3,8 |
| 20 | Image 307 | 1,5 | 3,8 |
| | RATA - RATA | 1,56 | 3,91 |
| | STANDAR DEVIASI | 0,07 | 0,13 |

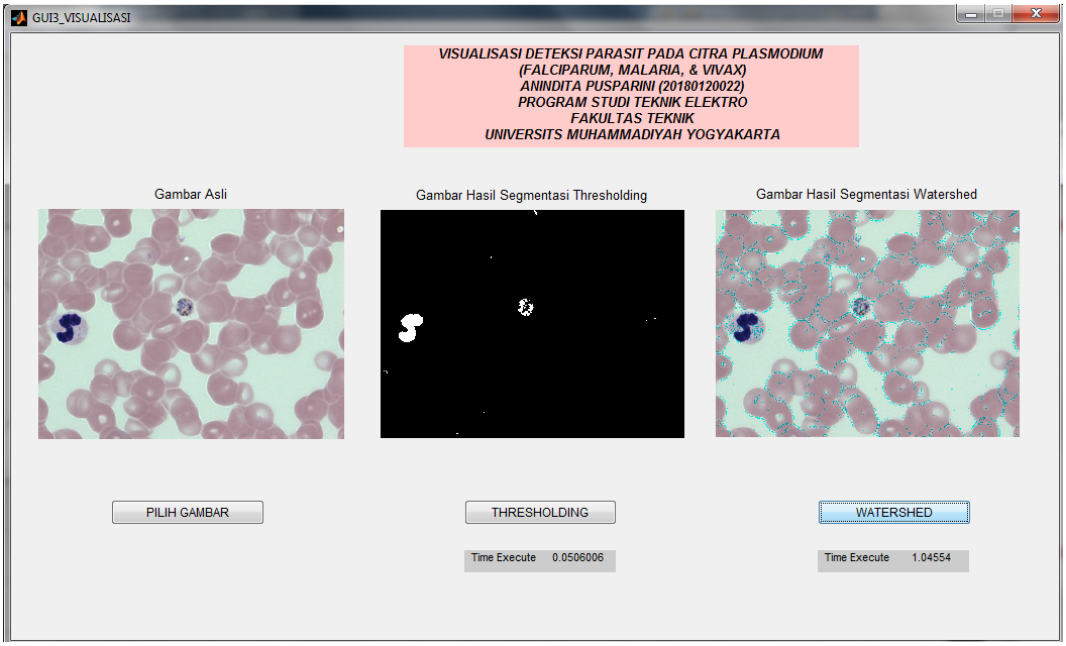
## 4. Lampiran D GUI

Tampilan GUI dengan tambahan waktu komputasi dari masing – masing plasmodium.

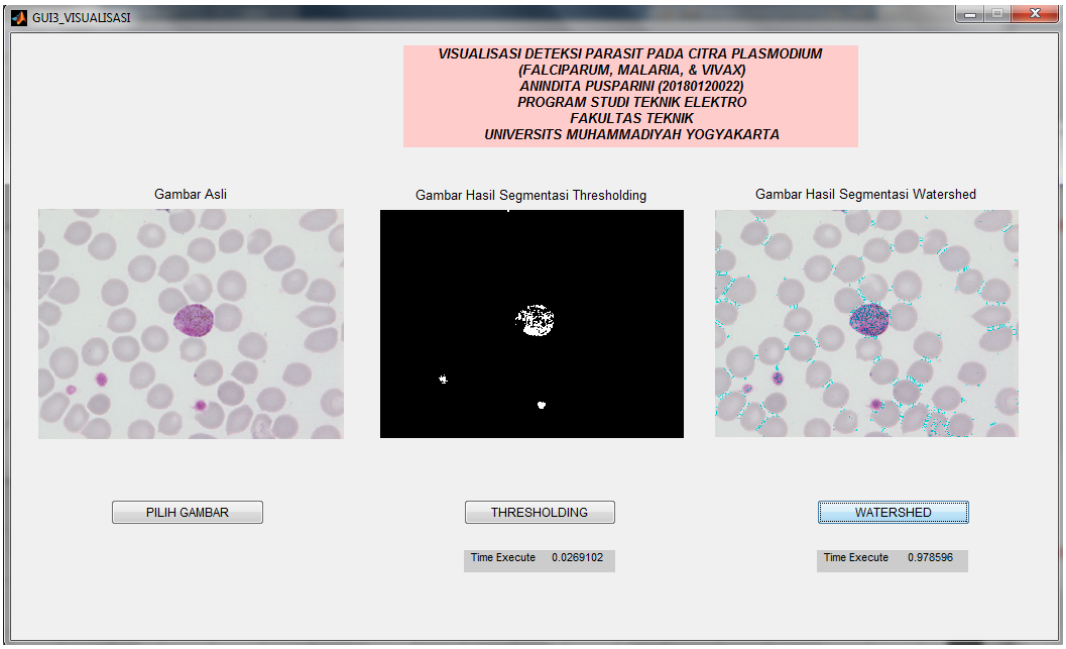
a. Plasmodium *Falciparum*




b. Plasmodium Malaria



c. Plasmodium *Vivax*



## 5. Lampiran E Listing Program

Listing Program Segmentasi *Thresholding*

```
 clc; clear; close all;
tic;
X = imread('.bmp');
%figure,imshow(X,map);%1

%title('Original indexed image');
%b = im2bw (X,map,0.7);
%imshow (b)

 b = im2bw(X,0.8);
%figure,imshow(b)%2
bw = imcomplement(b);
%figure,imshow(bw);%3

c = im2bw(X,0.55);
%figure,imshow(c)%4
bw = imcomplement(c);
figure,imshow(bw);%5
```

Listing Program Segmentasi *Watershed*

```
clc; clear; close all;

I = imread ('.bmp');
J = rgb2gray(I);
figure,imshow(I);%1
I1=imtophat(J, strel('disk',10));
figure,imshow(I1);%2
I2 = imadjust(I1);
gmag = imgradient(J);
figure,imshow(gmag,[])%3
BW = im2bw (I2,0.3);
figure,imshow(BW);%4
C=~BW;
figure,imshow(C);%5
D = -bwdist(C);
D(C)= -Inf;
L= watershed(D);
figure,imshow(L);%6
Wi=label2rgb(L,'hot','m');
figure,imshow(Wi);%7
im=I;
im (L==0)=0;
figure ,imshow(im);%8
```