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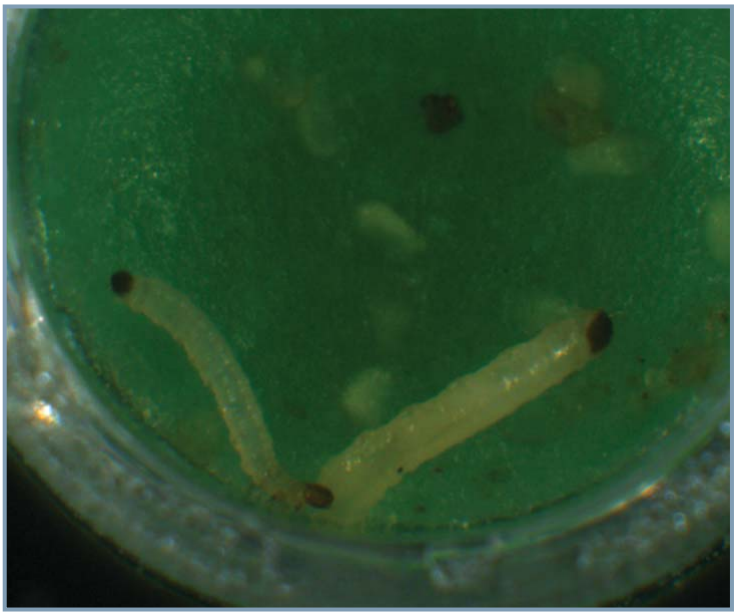
# # 834

# Mobility Assessment



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# Mobility Assessment

Image Analysis Report # 834 -

## Sample Description

Three images of the same worms, captured at different time were submitted for analysis.

## Purpose of Analysis

To demonstrate that the Clemex Vision image analysis system can distinguish the worms from the background and evaluate their mobility.

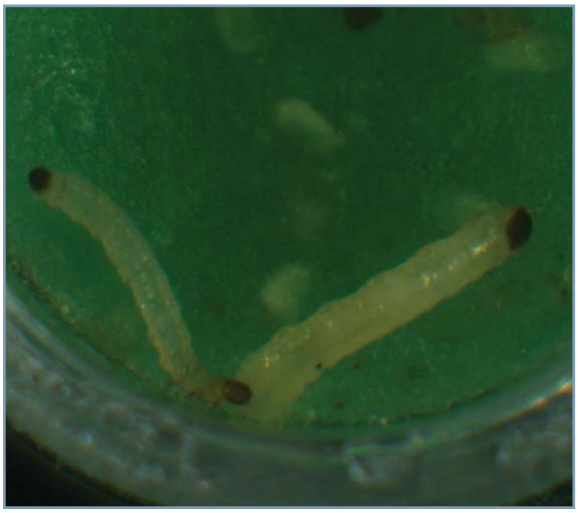


*Figure 1: Part of the original image (0.0078 mm/pixel).*

*Figure 2: Middle and last worms detection in cyan (yellow or first detection is also included in the cyan detection) with original worm position in yellow.*

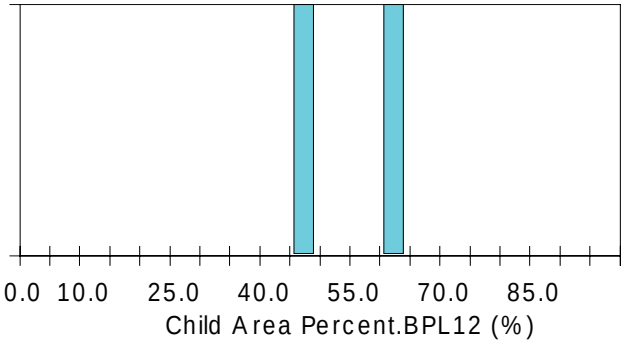
## Procedure[1]

For each image, the worms were detected using color thresholding. Artefacts were eliminated using some binary filters. Worms from the first image were represented into yellow, the ones from the second image were represented into magenta, and the worms from the last image were represented into green. All detections were combined into a unique color, the cyan, which contains all positions of the worms.

Comparing the originally detected worms (yellow) to the combination of all position (cyan), we obtain a percentage expressing the importance of the mobility for each worm. Worms were also classif ed as dead or alive.

## Results[2]

The measurement of area percent of yellow inside the cyan, along with the length, was performed for each group. The count and percentage of alive worms was also performed. Automated statistics and graphs were generated. Final results can be printed directly from Clemex Vision and saved for further use. A customized report was built using the Report Generator module. Raw data is linked to their respective objects for validation purposes. Raw data could also be exported in Excel format.




| | |
|---|---|
| Minimum: | 48 % |
| Maximum: | 61 % |
| Mean: | 54 % |
| Std Dev.: | 9 % |

*Figure 3: Worms' mobility distribution and corresponding statistics.*

## Equipment

| | |
|---|---|
| Calibration: | 7.8402 µm/pixel |
| Software: | Clemex Vision PE |

## Discussion

No significant difficulties were encountered for this analysis.

Two pictures might be sufficient to perform the analysis; however, using three increase the chances of capturing any movement.

Several kinds of measurements are possible with the Custom Measurement tool and many ways of expressing them are available with the Report Generator module.

1 *Images taken during the procedure are available in appendix A*

2 *Complete results are available in appendix B.*

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# Appendix A: Image Analysis Steps

# Image Analysis Steps

*Image 1: Outline view of the worms as detected in the first image.*

*Image 2: Outline view of the worms as detected in the middle image.*

*Image 3: Outline view of the worms as detected in the last image.*

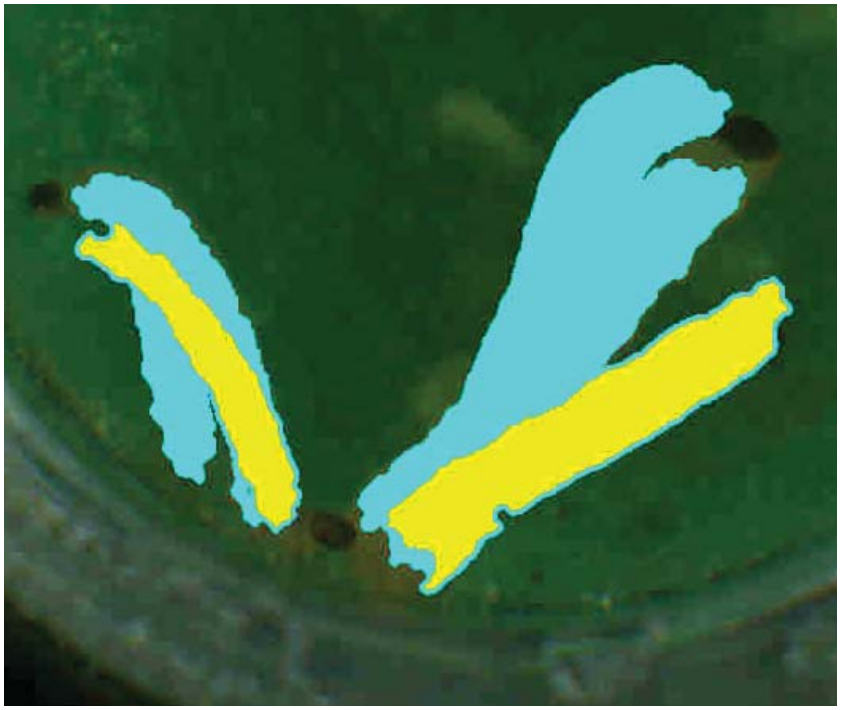

*Image 4: All worms detection combined in cyan with the first worms detection on top (yellow). (Please note that the yellow detection was decreased here in the only purpose of showing that the cyan bitplane continues under it.)*

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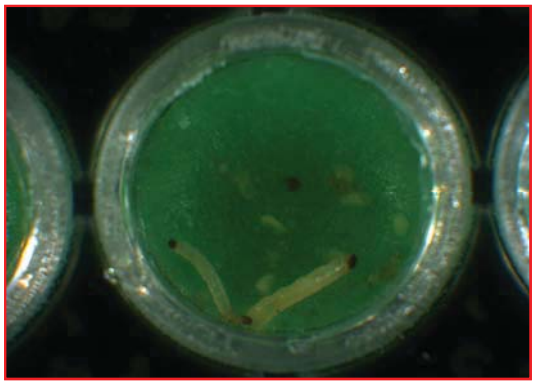
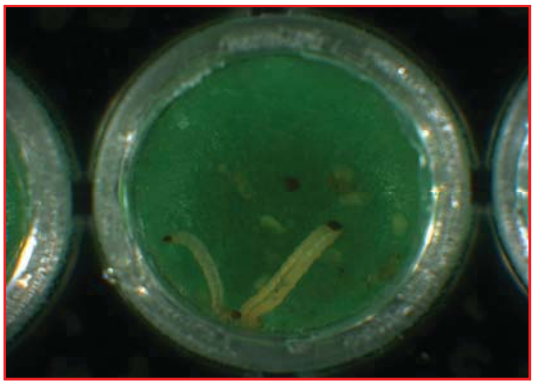
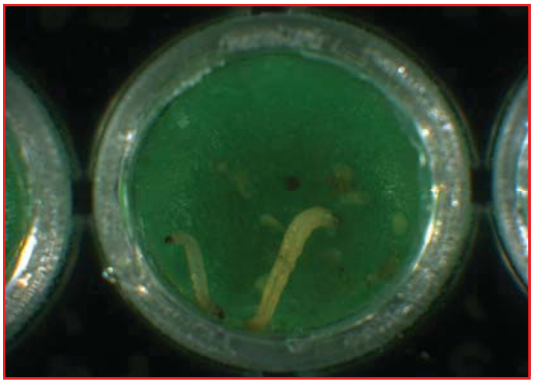
# Appendix B: Results

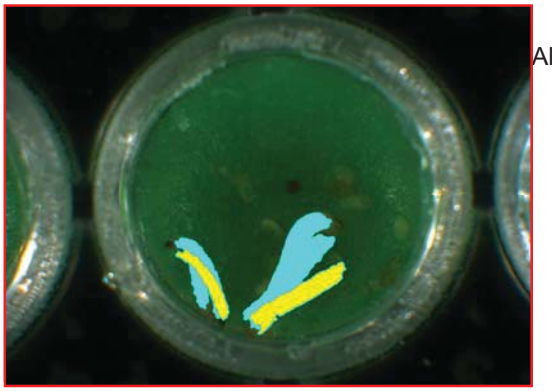
# Mobility Assessment

| | | | |
|---|---|---|---|
| **Date:** | 2009-Jul-23, 1:42:28 PM -04'00' | **Magnification:** | |
| **Company:** | CLEMEX | **Calibration:** | 7.8402 µm/pixel |
| **Department:** | Laboratory | **Units:** | millimeters |
| **User Name:** | | **# Fields:** | 1 |
| **Sample ID:** | Sample 1 | | |

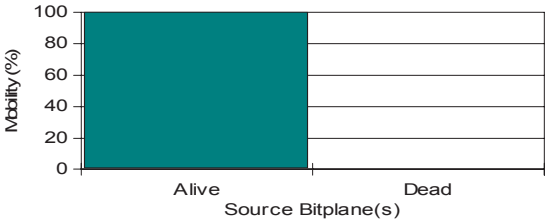

1

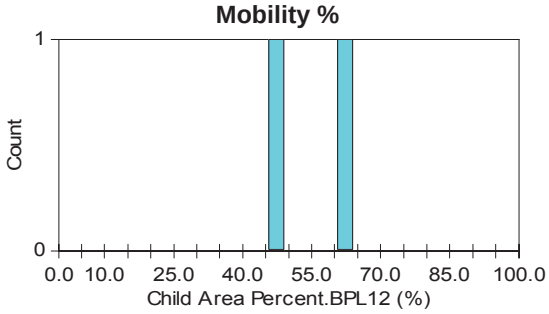

2

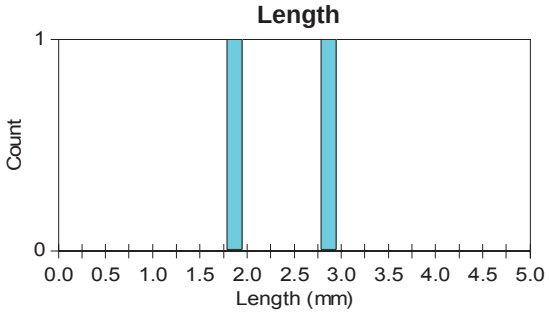

3


All

| | Count | % |
|---|---|---|
| **Alive:** | 2 | 100 |
| **Dead:** | 0 | 0 |




| | | | | |
|---|---|---|---|---|
| **Count:** | 2 | | 2 | |
| **Min:** | 47.8 | % | 2.0 | mm |
| **Max.:** | 61.0 | % | 2.9 | mm |
| **Mean:** | 54.4 | % | 2.4 | mm |
| **Std. Dev.:** | 9.4 | % | 0.6 | mm |

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