Chromaticity constant
Introducing a new ordination for automated extraction of grainsize data from true colour images

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The Problem

A order on the RGB colour space is almost impossible. Mathematical morphology (MM) of true colour images is better on *HSV*, *HIV* and *HLS* spaces. But how combine directly Hue (0°- 360°) with Saturation (0-255)?

Chromaticity constant

Our objective is to grade chrome sensation. A function is defined using the smaller angle between two hues from a minimum color defined in each case. Then hue and saturation are reduce to one value. A metric (chromaticity constant) is defined as the maximum distance between saturation and hue.
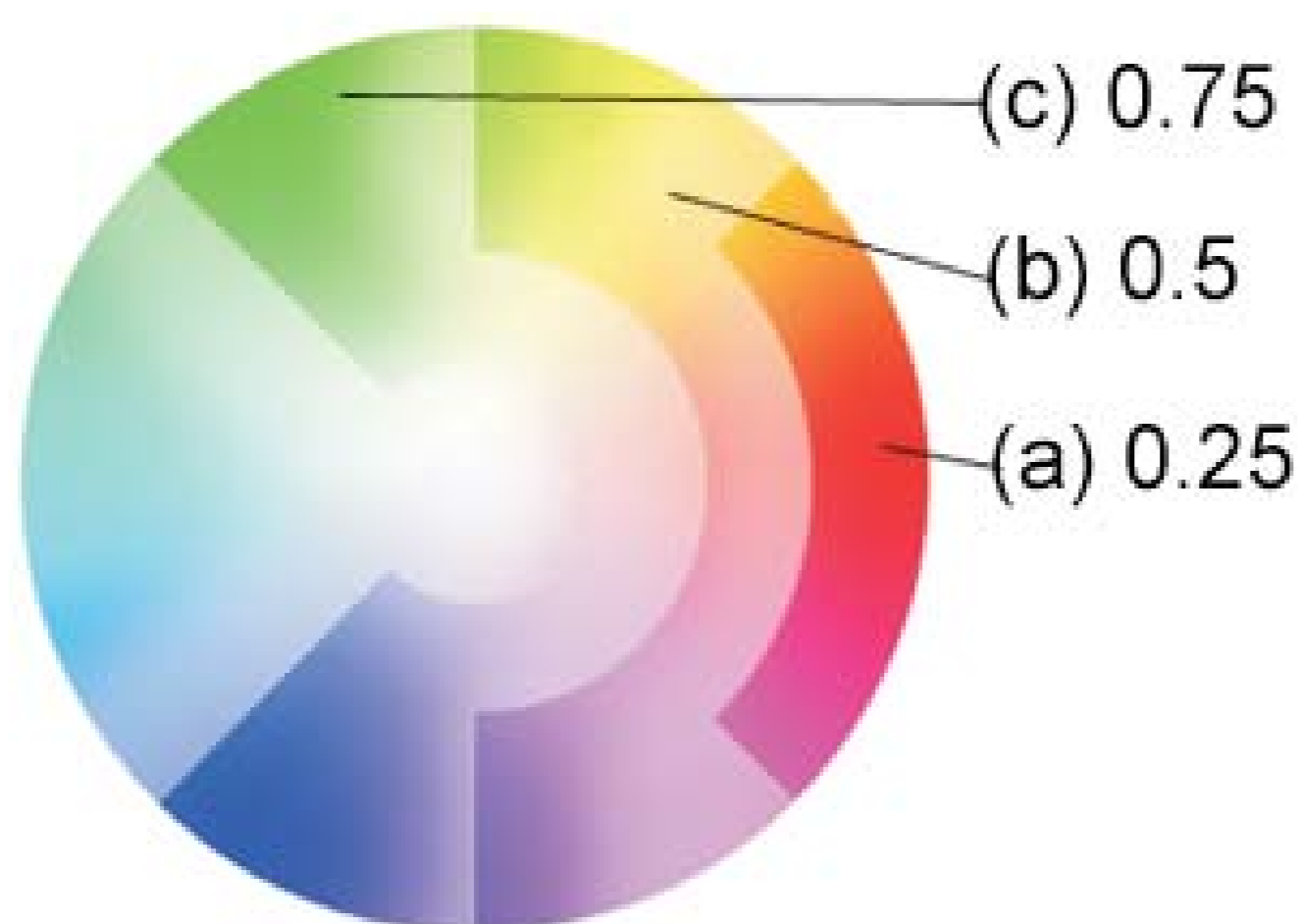

Fig 1. Proposed metric on HSV with red on initial position.
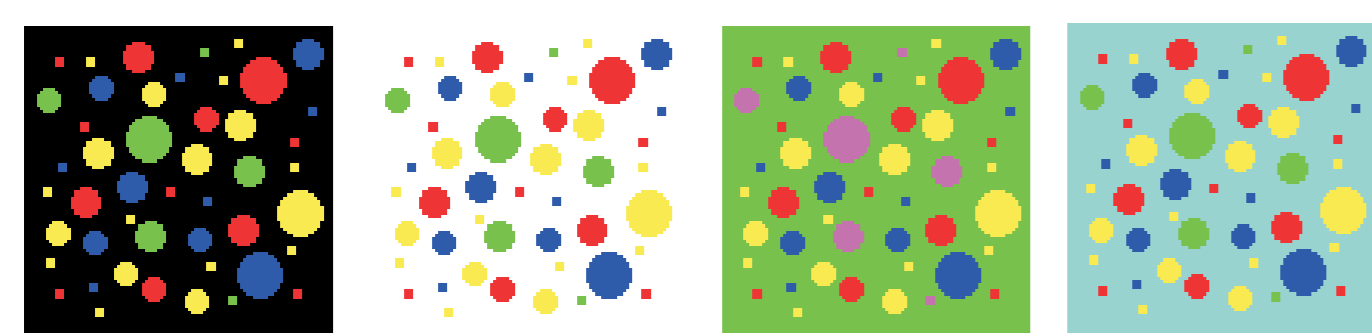
Results
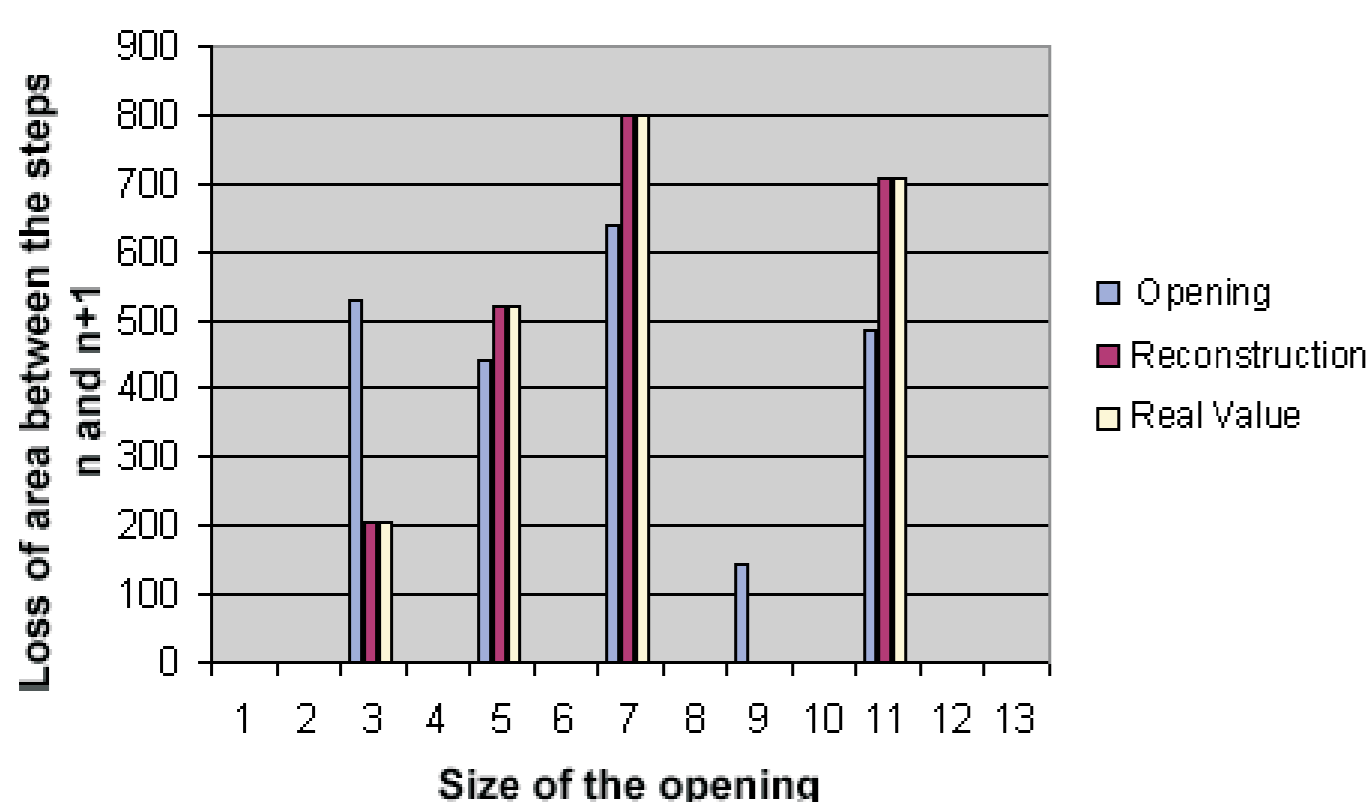

Fig 2. Synthetic images used as tests.

Fig 3. Opening granulometry pattern spectrum with and without reconstruction for Fig 2 (same results).

Results - Real Images
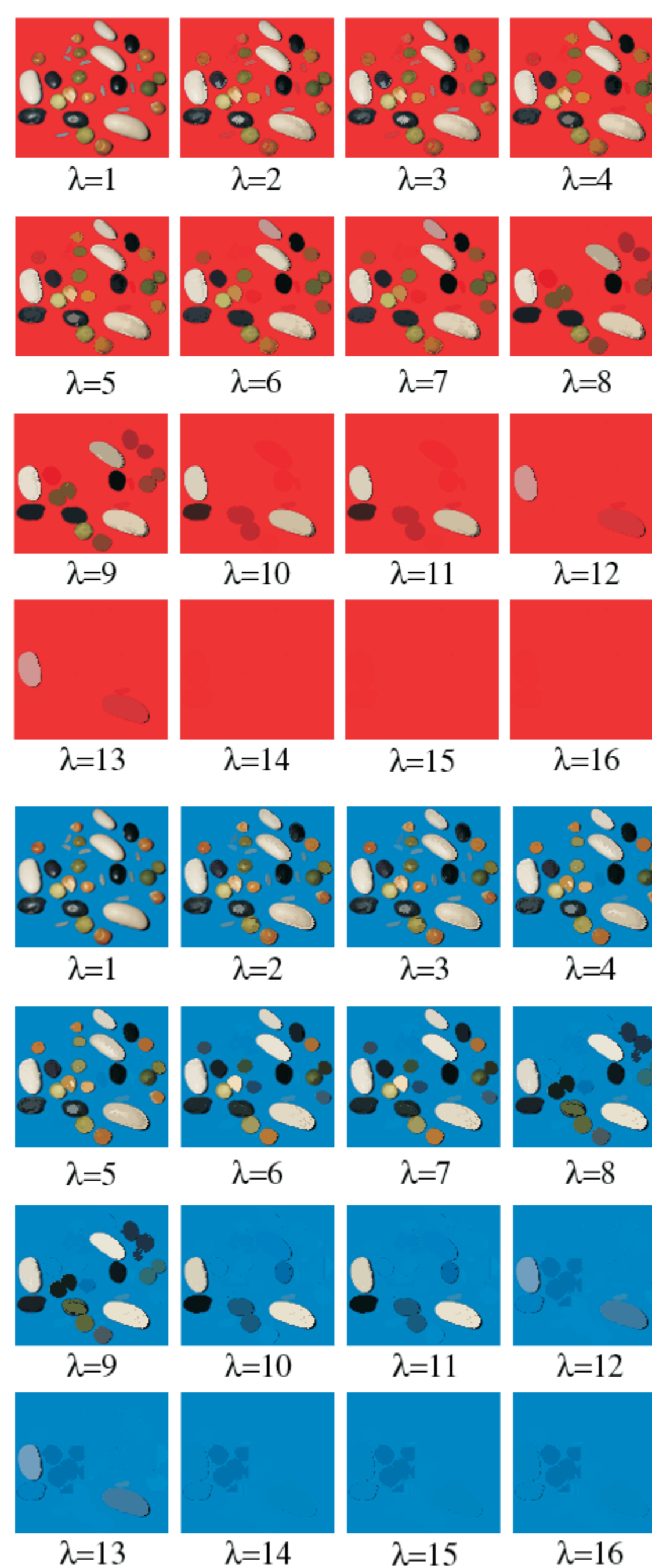

Fig 4. Same image with different background colors.

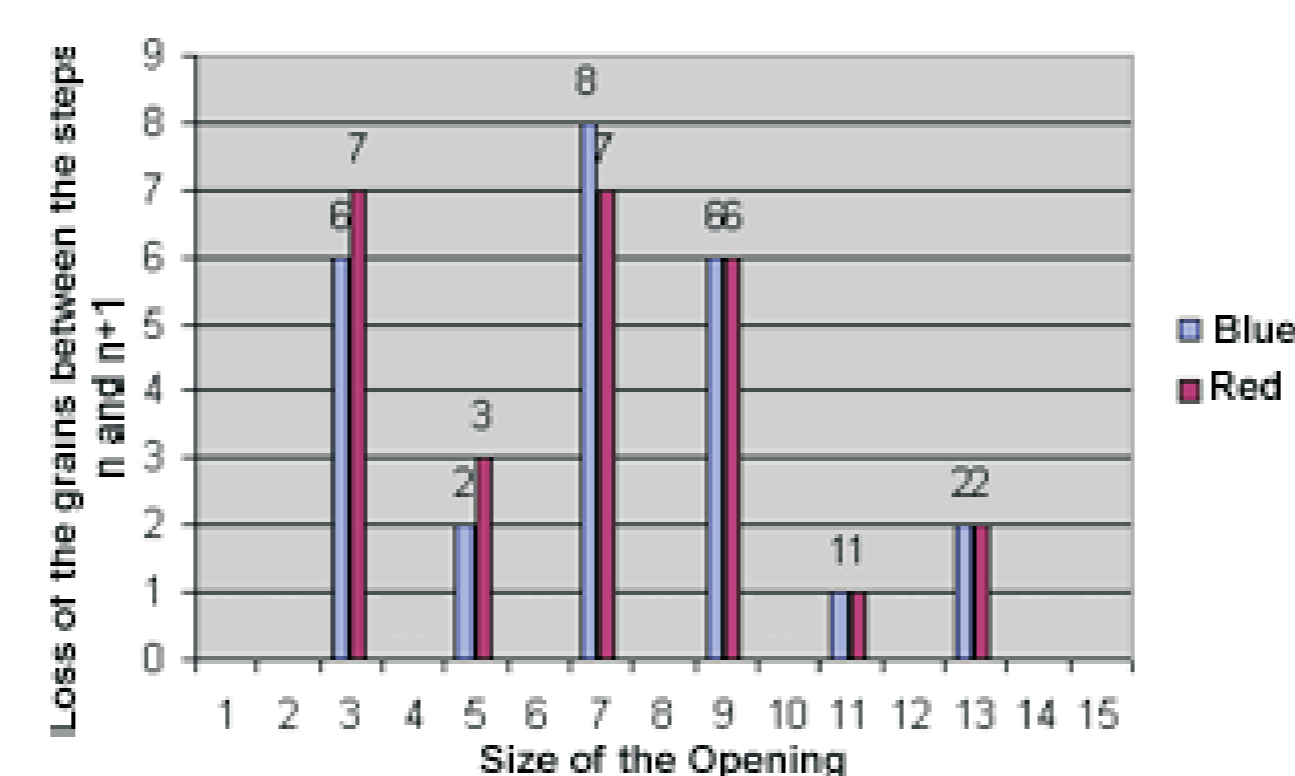**Fig 5.** Steps of grain elimination. (Grain size = λ).
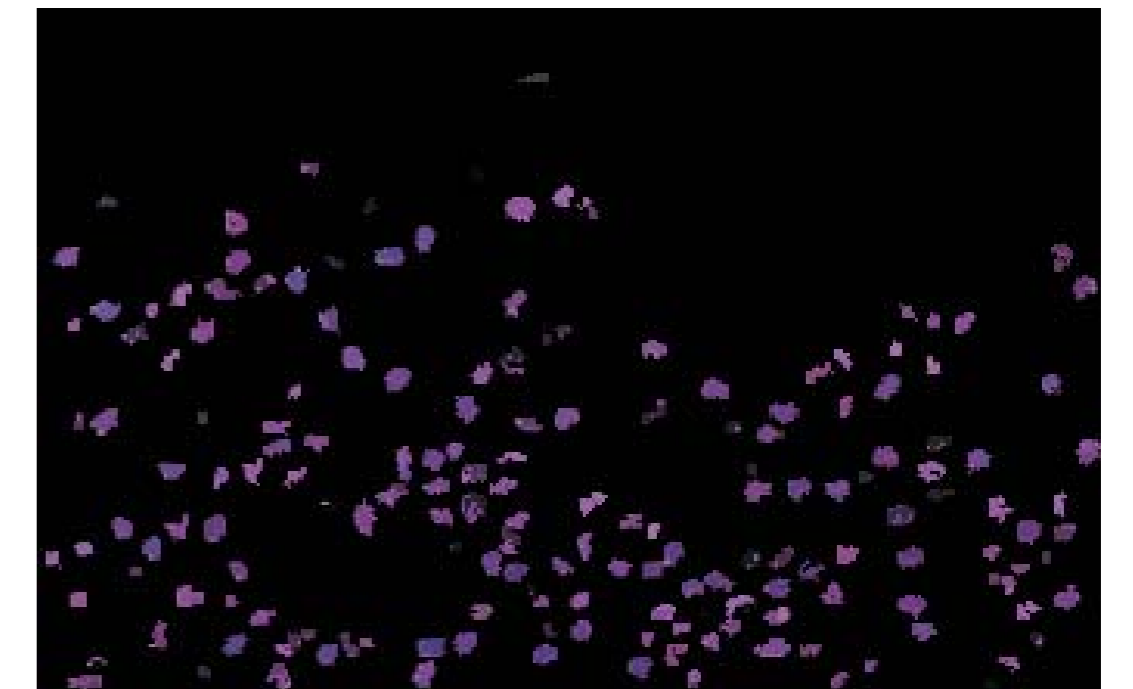

Fig 6. Pattern spectrum for Fig 4 and 5.

Fig 7. Exemple for HIV detection.
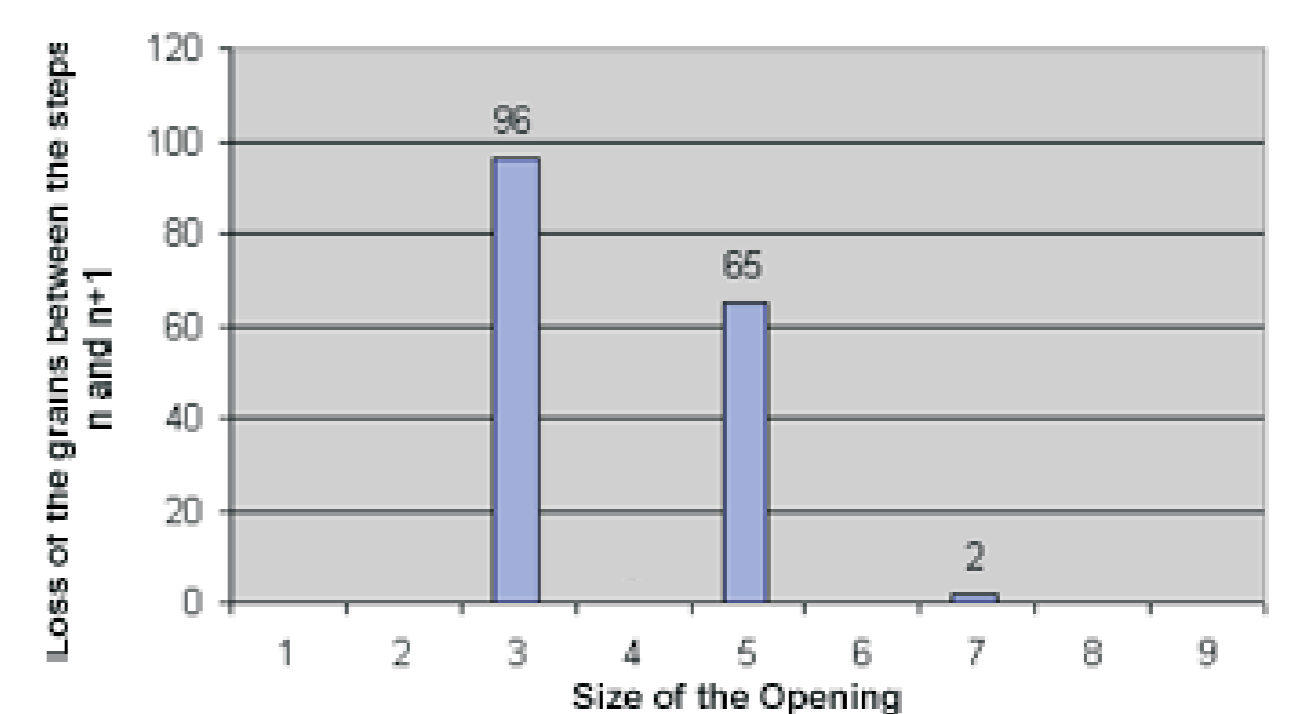

Fig 8. Pattern spectrum with reconstruction of Fig 7.

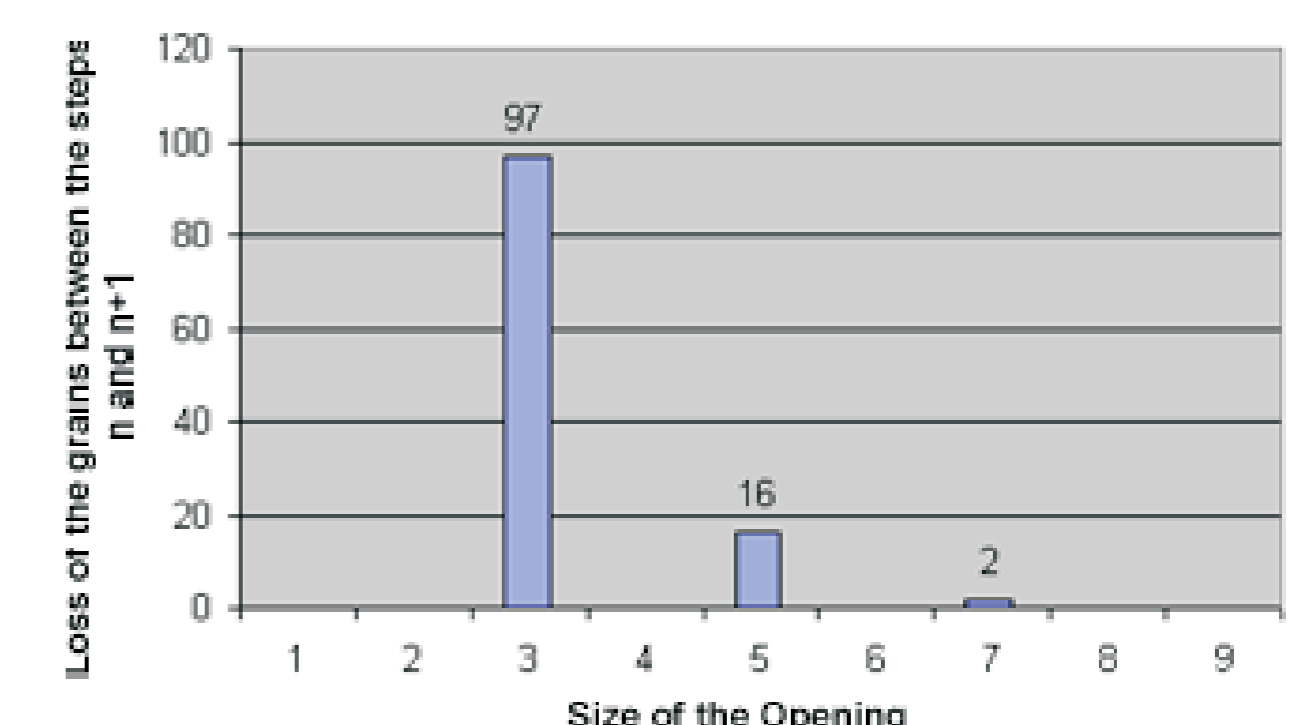**Fig 9.** Water algae count on the microscope image.

Fig 10. Pattern spectrum of Fig 9.

Conclusion

Test on synthetic and real images show excellent results. False colours are not detected on the experiments. Background (minimum) color is important on the result with transparent objects. The luminance channel presents no influence.