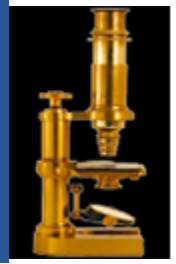
Computer Applications

ImageJ 10

Dr. Labeed Al – Saad , Basrah University, College of Agriculture



ImageJ

Image Processing & Analysis in Java

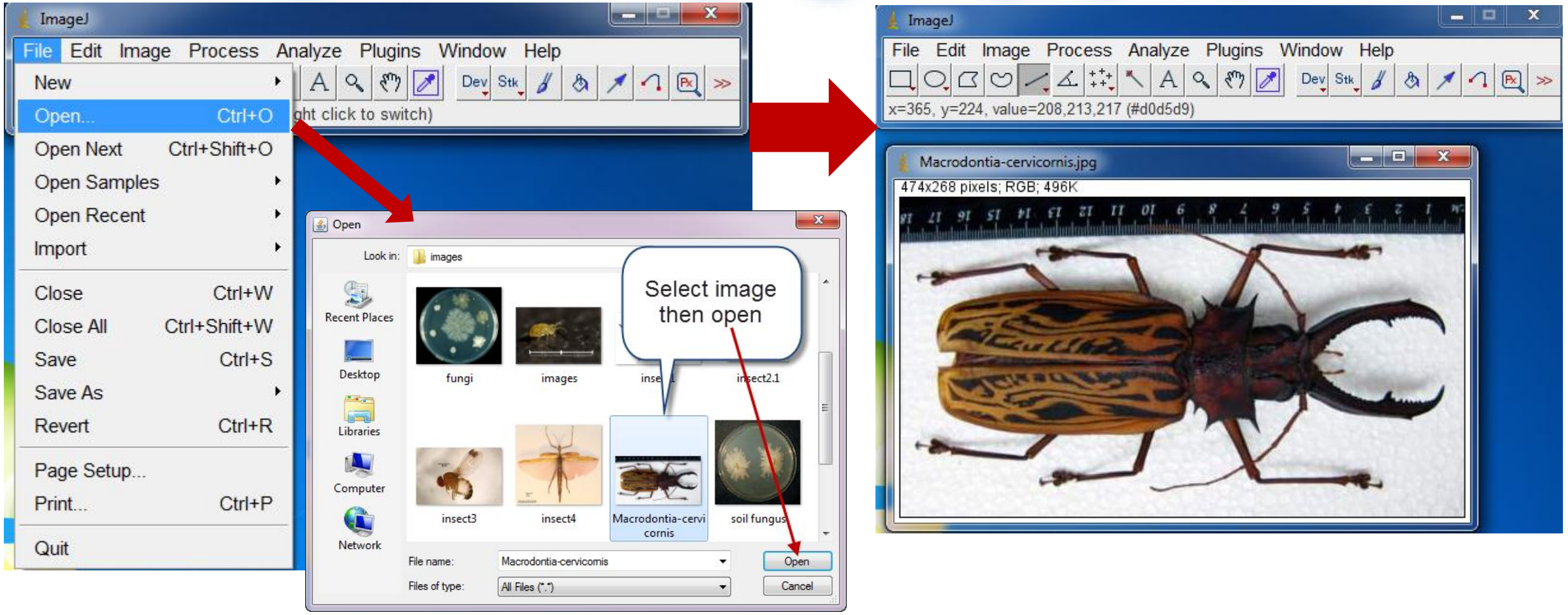
Measuring and Counting objects - preparation

❖ To make measurements to the objects (distance, length, width, size, area, angle,.. *etc.*.) in the scientific image, the image should be included a well-known measurement object (such as a ruler, known dimensions square object, known radius circular object... *etc.*.) to set a measurement scale depending on it.

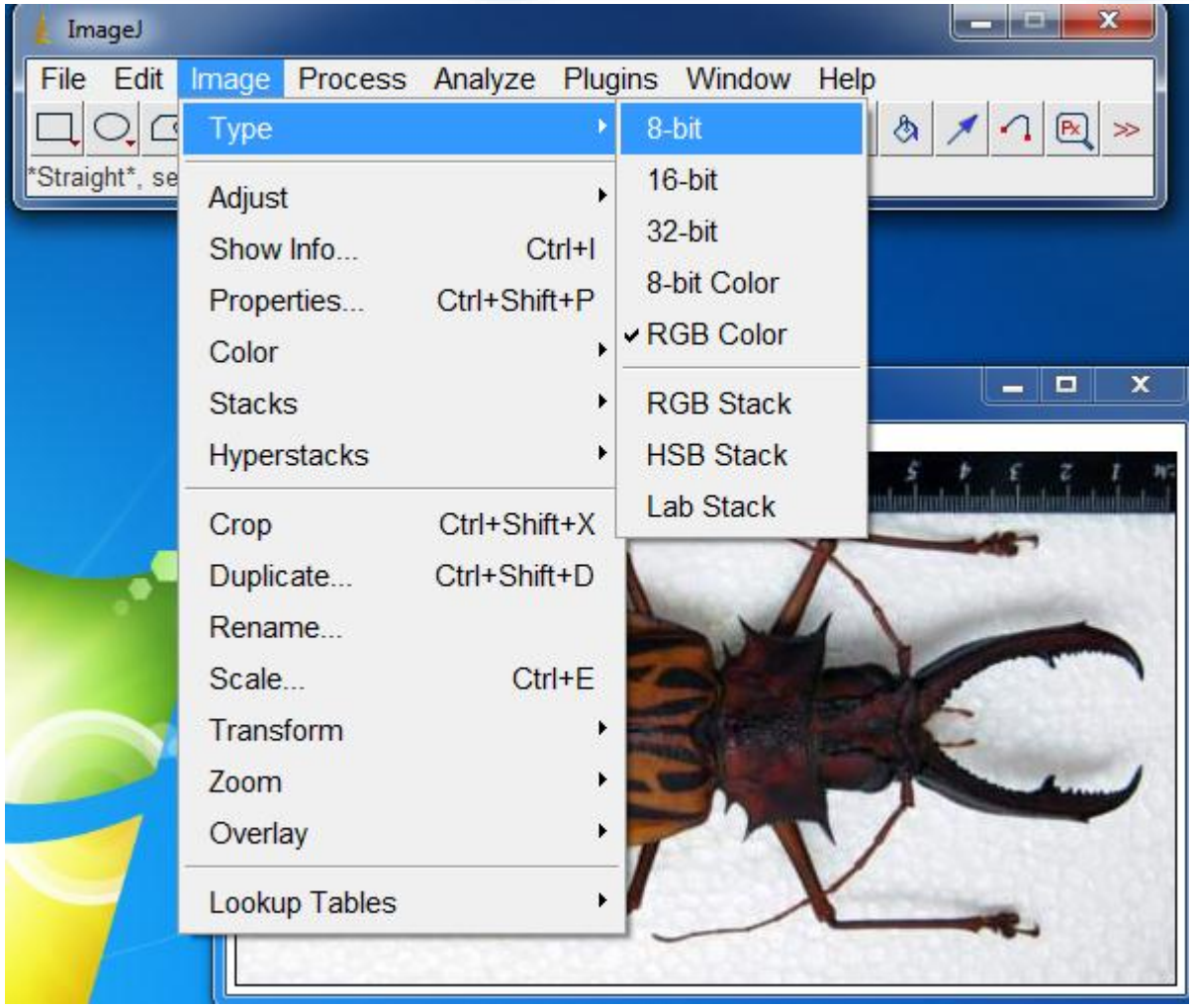
Measuring and Counting objects - preparation

- The starting image should be as high resolution as possible. The high quality image the high accuracy measurements.
- Open the image in the imageJ: **File >> Open >> brows then open OR Drag your image and drop it on ImageJ tools ribbon.**
- Convert the color image to grayscale 8-bit image: **Image >> Type >> 8-bit.**
- Scale measurements: **Draw straight line between two points of known measurements object >> go to Analyze >> Set Scale >> write the known length in "known distance" box >>write the measurements units in "Unit of length" box >> OK**
- Now the object is ready for measurements.

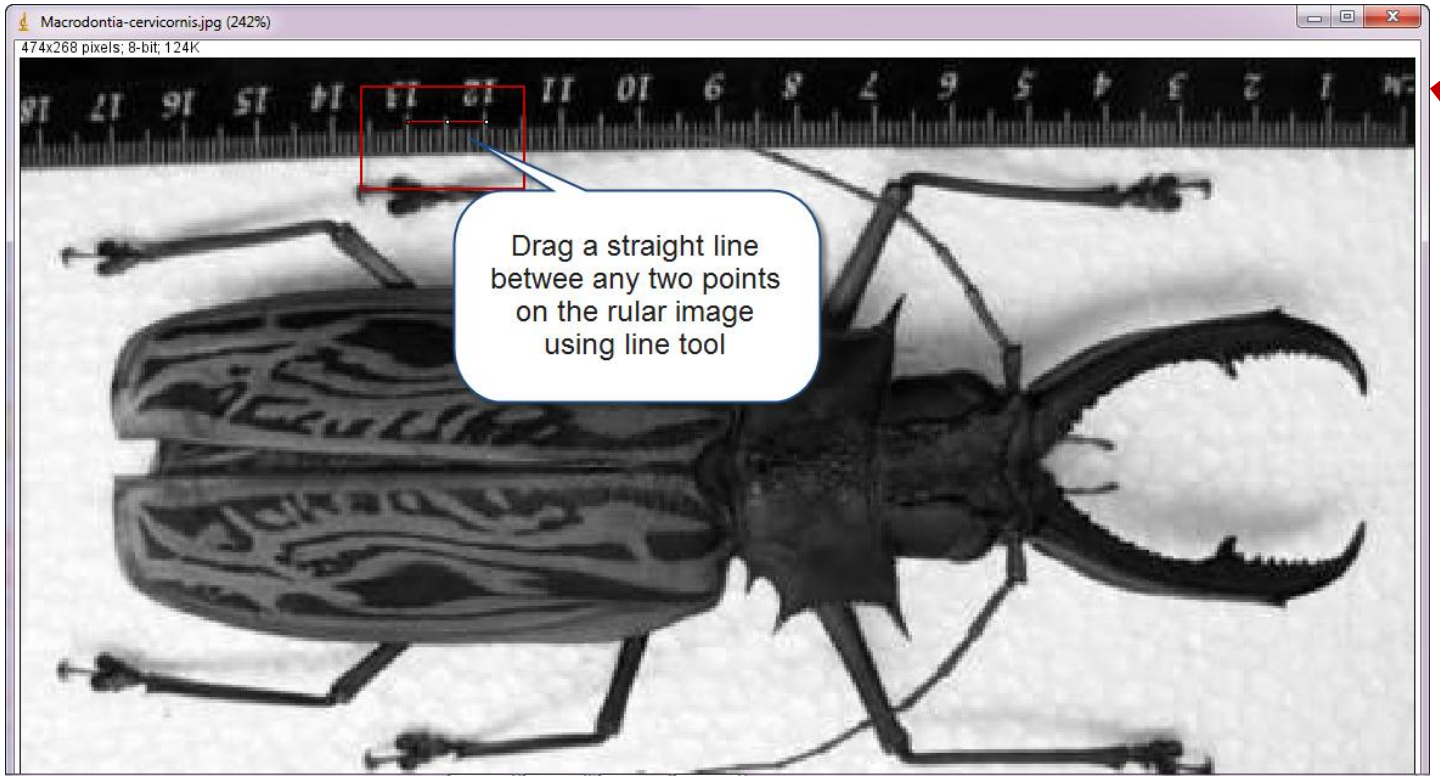
Measuring and Counting objects - preparation

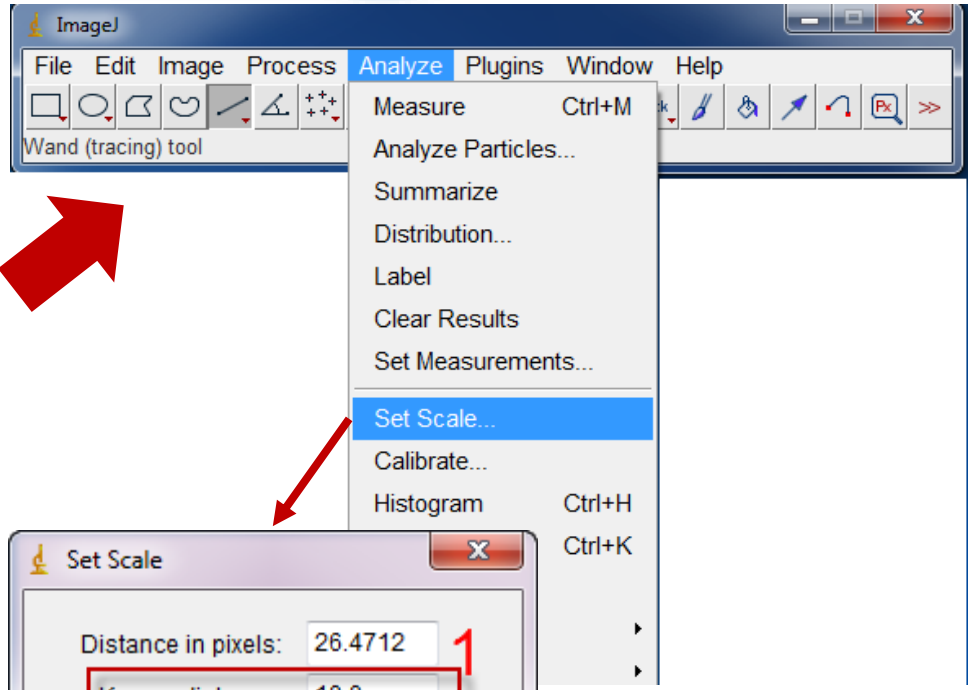


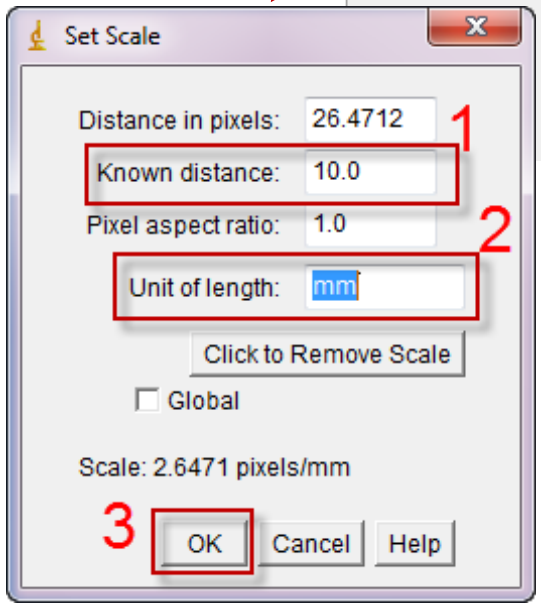
Measuring and Counting objects - preparation



Measuring and Counting objects - Scaling



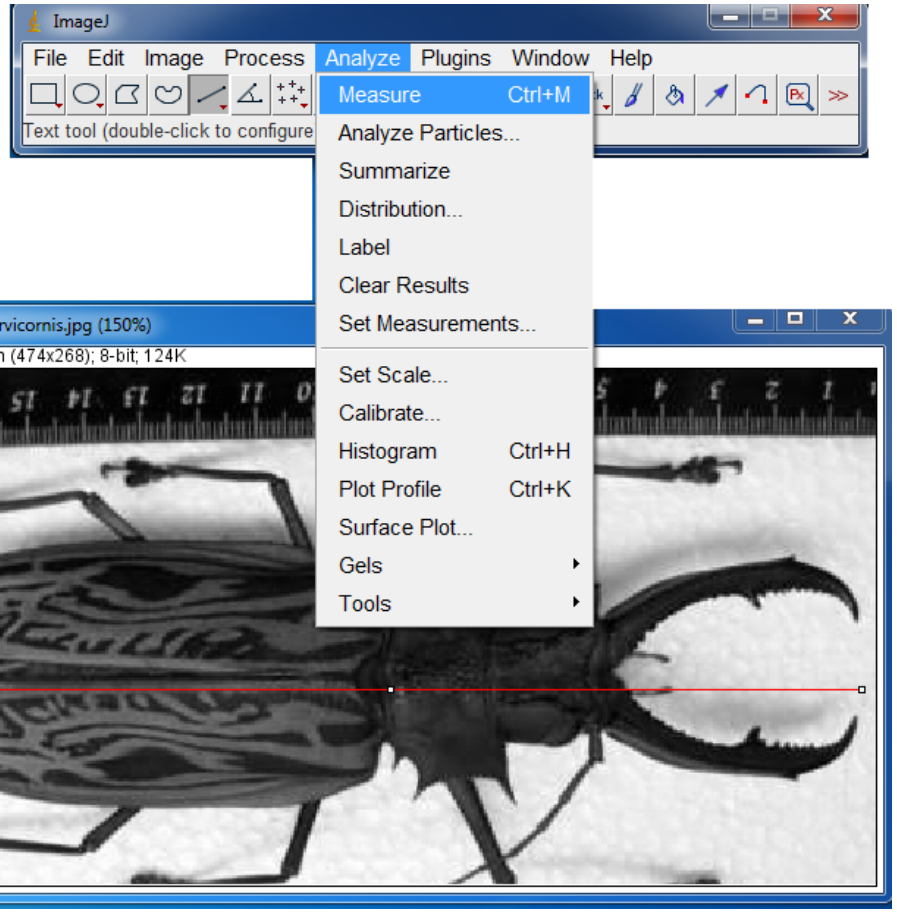


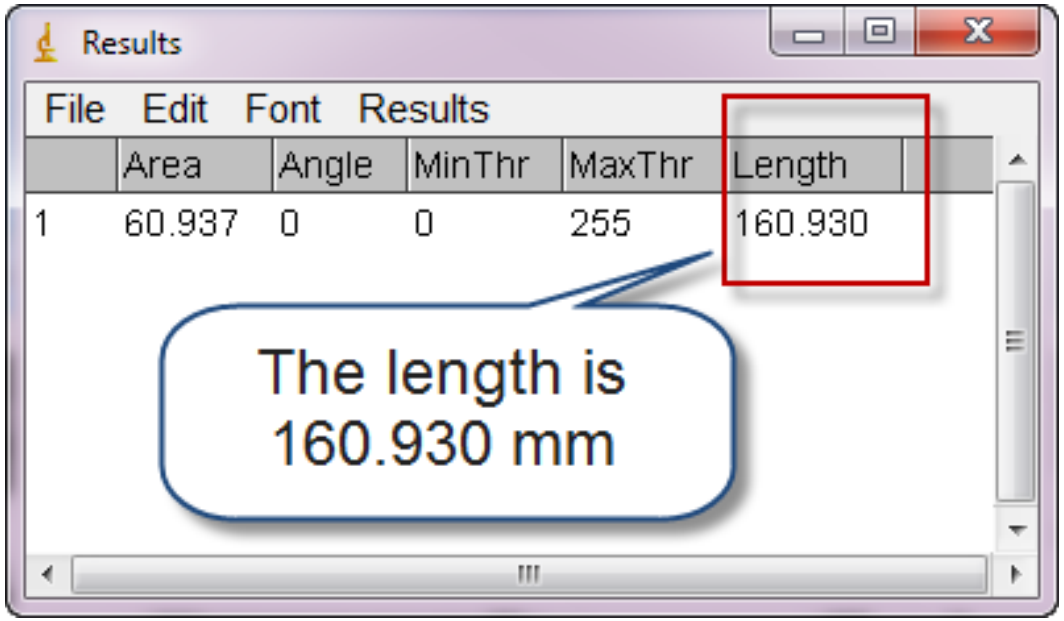


Measuring and Counting objects - measurements

❖ Measuring the length: **Drag a straight line along the insect >> Analyze >> measure OR**

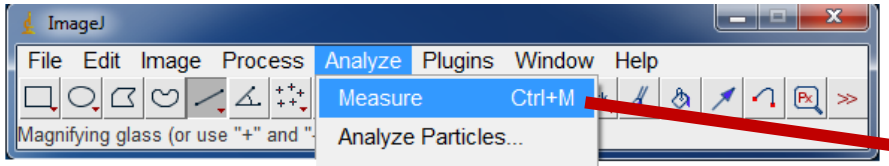
Ctrl+M >> The results will appears in results window.

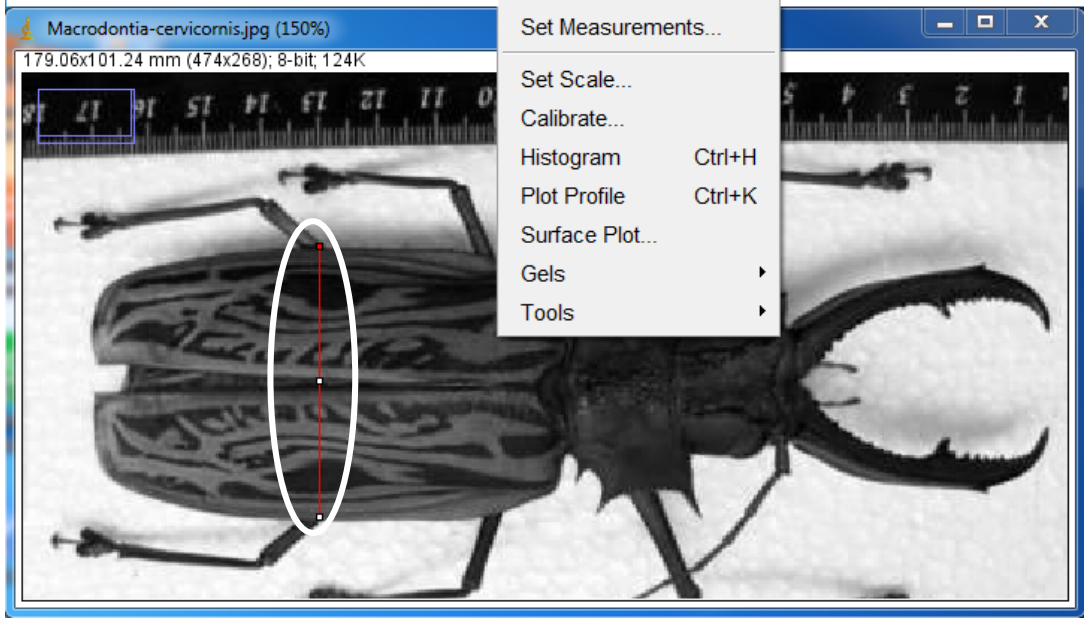


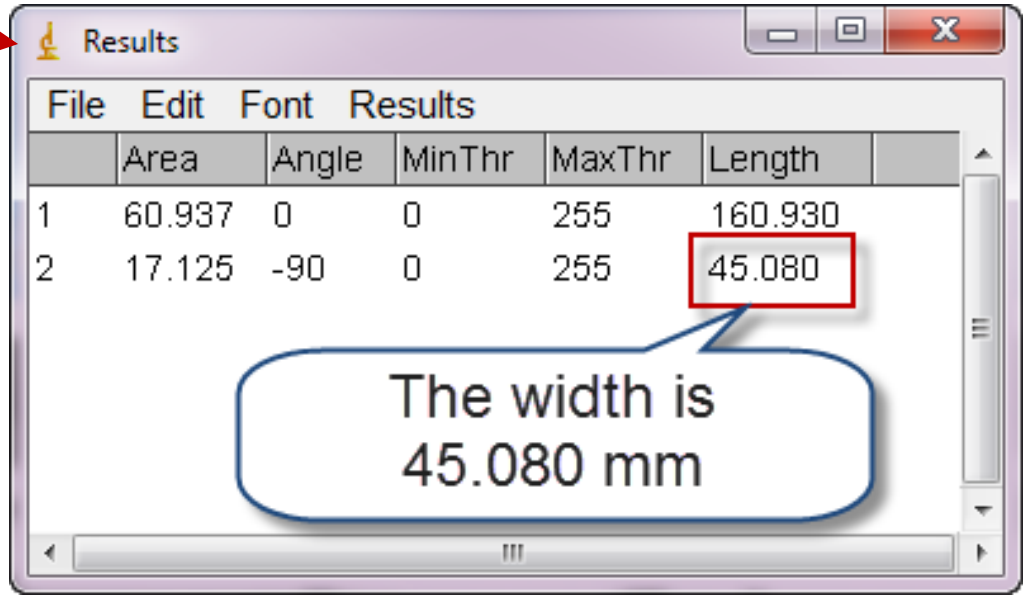


Measuring and Counting objects - measurements

❖ Measuring the width: **Drag a straight line along widest area of the insect >> Analyze >> measure OR Ctrl+M >> The results will appears in results window.**

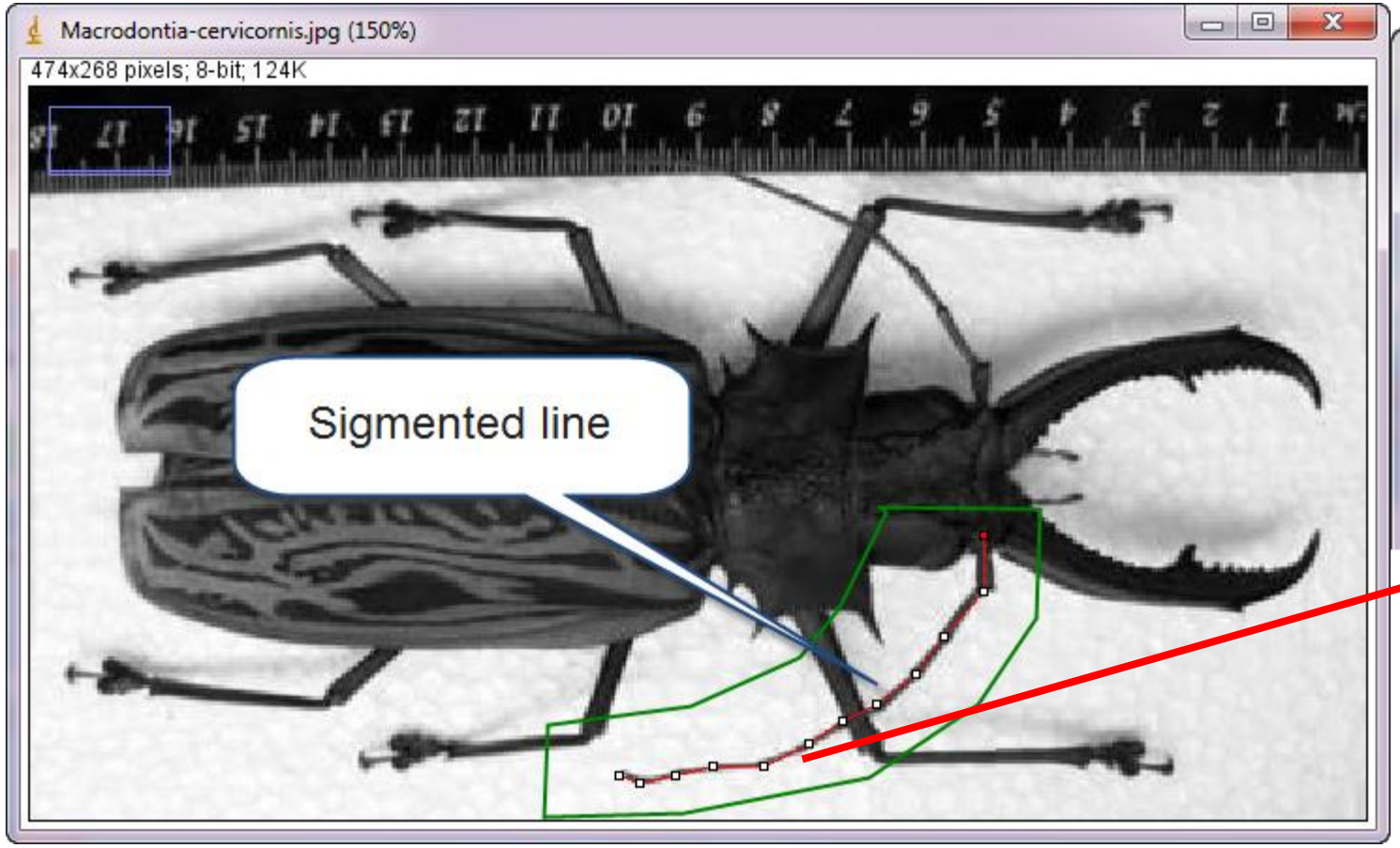


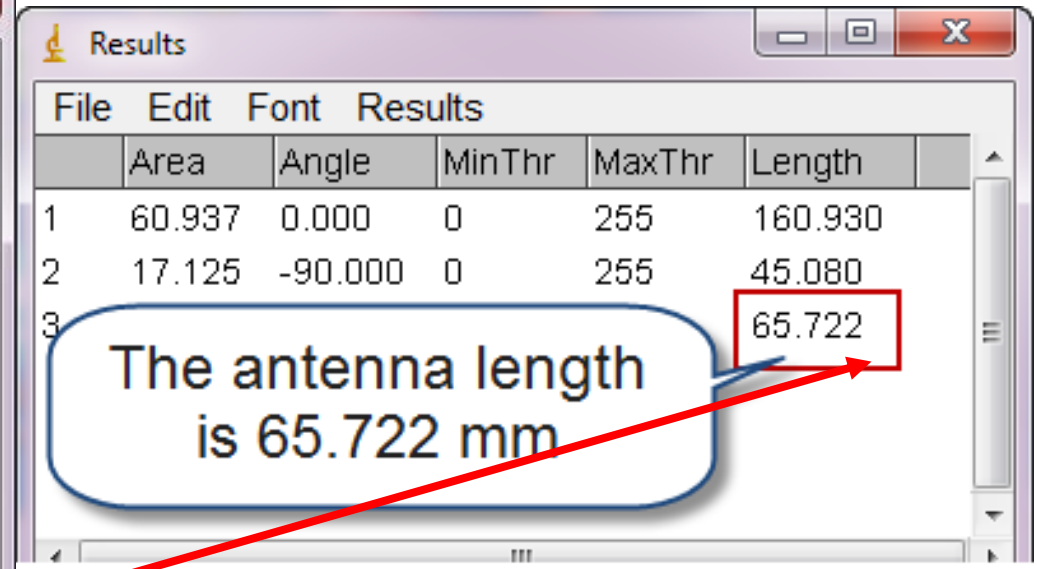




Measuring and Counting objects - measurements

❖ Measuring the antenna length: **Drag a segmented line (right click on line tool and change to segmented) along the antenna >> Analyze >> measure OR Ctrl+M >> The results will appears in results window.**

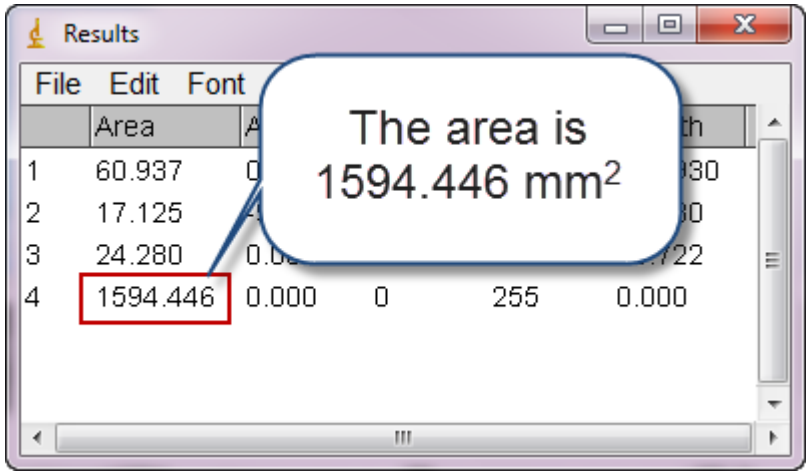




Measuring and Counting objects - measurements

❖ Measuring the left wing area: **Select the left wing area by Free hand selection**  **>> Analyze >> measure**

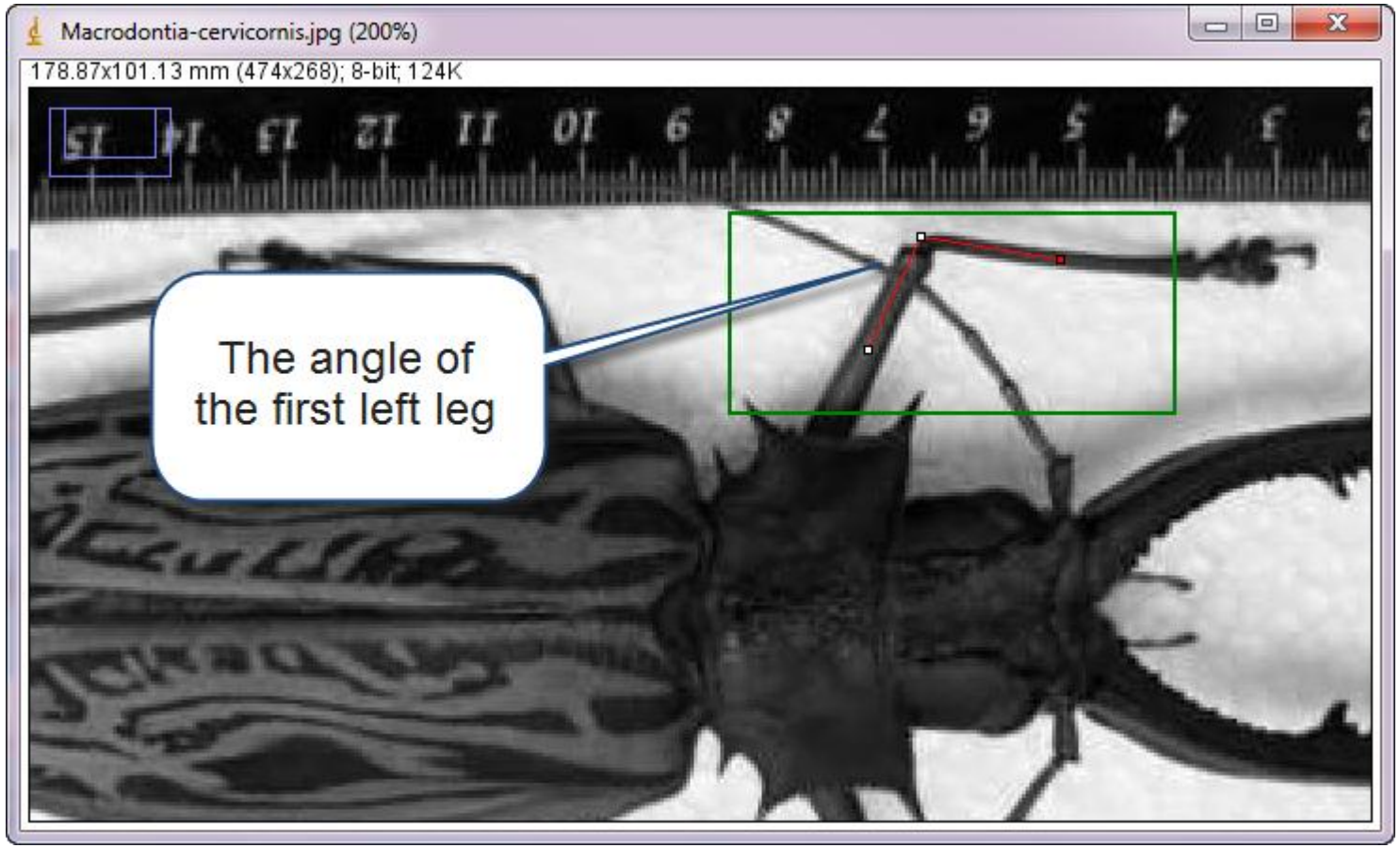
OR Ctrl+M >> The results will appears in results window.

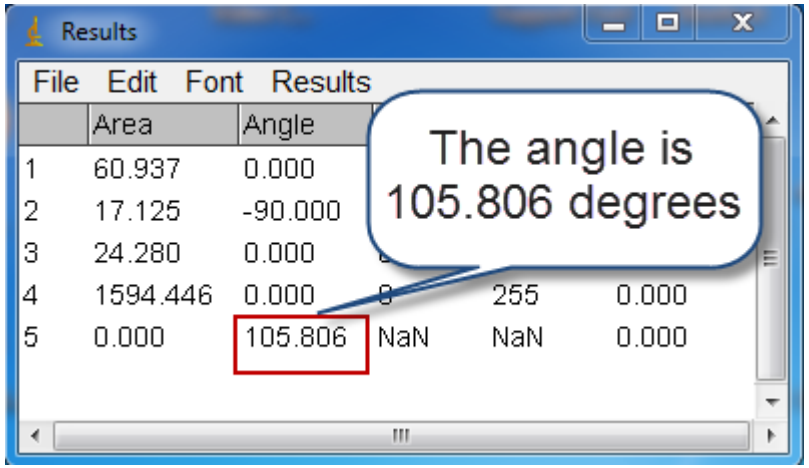


Measuring and Counting objects - measurements

❖ Measuring the leg angle: **Draw angle on the leg using Angle Tool**  **>> Analyze >> measure OR Ctrl+M >>**

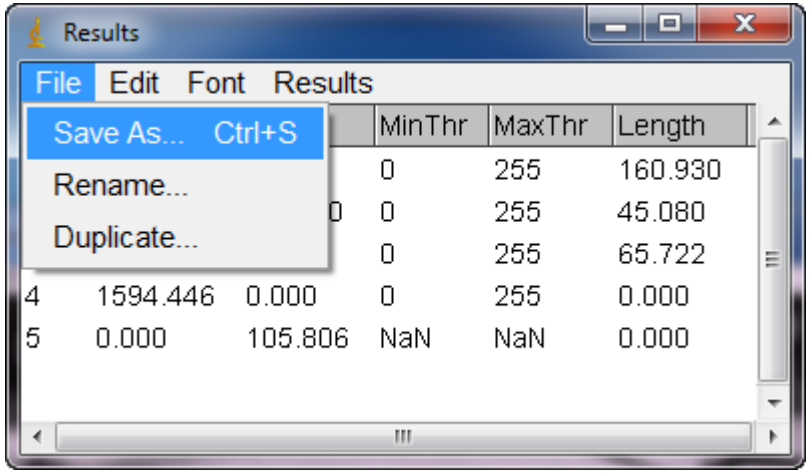
The results will appears in results window.

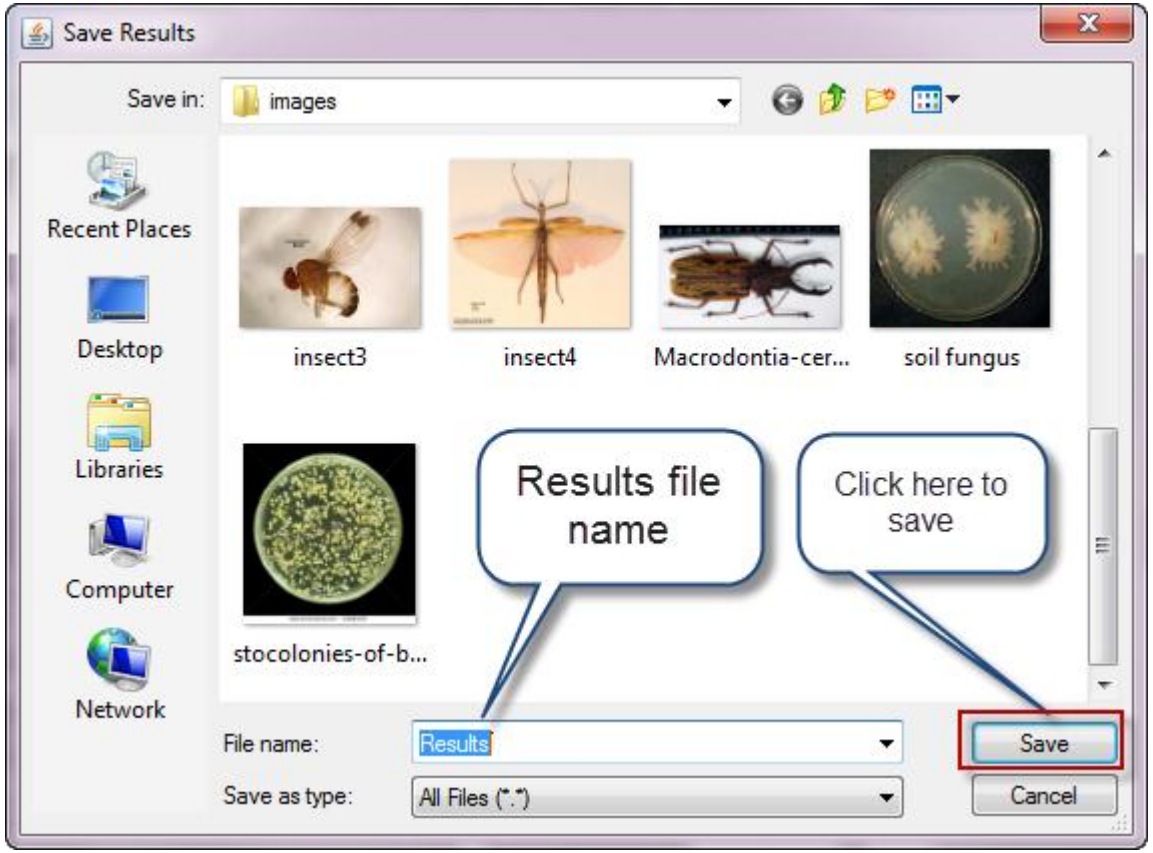




Measuring and Counting objects – Save results

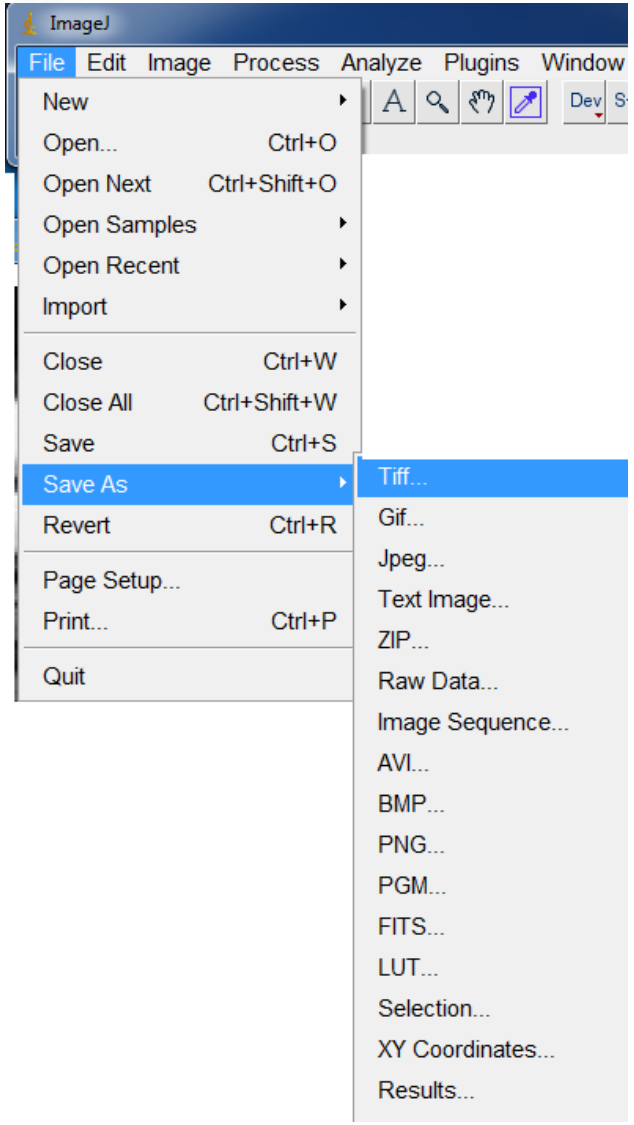
❖The results can be saved as Excel sheet: **File >> Save as >> Brows then save**.





Measuring and Counting objects – Save image

Images from digital cameras are usually saved as JPEG files. JPEG is a type of memory compression that results in the loss of some data. A JPEG image degrades each time it is opened, edited and resaved. It is best to save a file in a 'lossless' format such as a TIFF during the editing process: **File >> Save As >> Tiff**



Measuring and Counting objects – Counting

To count objects in the work field manually, you must do what below:

- Open Image.
- Use Multi-Point tool.
- Pint the objects you want to count.
- When finish go to Analyze >> measure >> the results window will appear containing the pointed objects count with X and Y coordinates of each point position.

Measuring and Counting objects – Counting

To count objects in the work field automatically, you must do what below:

- Open Image>
- Convert Image to gray scale 8 bit.
- Threshold the Image (make it black and white).
- Process >> Binary >> Watershed (to separate merged objects).
- Go to Analyze >> Analyze particles and type the upper and lower limits for particle size >> OK >> each particle size will be outlined and numbered in new window. The data window will contains measurement for each particle.