SOP for Microplastic Pictures and Measurements

PURPOSE

This SOP describes the procedure by which all subsampled particles will be imaged and measured using a microscope camera attachment and Toup View software (note, this is specific to a specific software in our lab with our Leica microscope and will need to be adapted according to the software in your laboratory).

OVERVIEW

Here, picked particles will be imaged and measured before they are chemically identified.

MATERIALS

- Stereomicroscope
- Digital camera attachment
- Computer connected to microscope
- ToupView Software (OMAX)

Pictures and Measurements

1. Open ToupView software and select the camera attachment from the 'Camera List'.
2. Ensure microscope calibration is accurate. Check calibration by placing a ruler under the microscope. Add a scale bar using: Measurements > Scale bar > *Set Scale* (e.g. 1 mm) to ensure the scale bar matches with 1 mm on the ruler. If it doesn't, calibrate the microscope. *Calibration does not need to be checked daily but should be checked often. If you move the microscope vertically along the arm (attached to the base) check that the calibration is correct.*
   a. *Note objective used.*
   b. *Options > Calibrate (a red line will appear)*
   c. *Align red line onto ruler to measure (e.g. red line measures 1 mm on the ruler, longer measurements are better for accuracy).*
   d. *Select correct magnification from dialog box.*
   e. *Fill in 'Actual Length' field in dialog box. Pixels and Resolution will be automatically calculated.*
   f. *Add in additional magnifications for other objectives if needed.*
   g. *Click 'Apply'.*
3. Bring the petri dish of subsampled particles to the microscope connected to the computer.
4. Place the petri dish onto the microscope base. Focus on each particle using the microscope by adjusting the course adjustment knob and then the fine adjustment knob. Use either the black or white microscope base (whichever allows a clearer view of the chosen particle).
5. Add a scale bar to the view using: Measurements > Scale bar > *Set Scale* (e.g. 1 mm). Move the scale bar to desired position on the screen by clicking and dragging.

Note: If you try to add a scale bar and the measurement appears in pixels, it is because you are trying to add a scale bar to an image (.jpeg).

6. To take an image using ToupView software, click 'Snap'.
7. Save the image of the particle go to File > Save As > *Name the file* (e.g. with the sample name and number of particle). > Save (As JPEG).
8. To take measurements of the particle:
   Fragments, Spheres, Foams, Films: Measurements > Line > Arbitrary Line. Drag the line across to measure the two longest perpendicular axes (length and width). Double click at the point you want the measurement to end.
9. Fibers: Measure the width using the Arbitrary Line. Measure the length using Measurements > Curve > Mode 1. Drag the line along the length of the fiber, following its shape as closely as possible. Double click at the point you want the measurement to end.
   Note: For fibers, do not measure frayed projections and use segmented/curved lines where necessary. If a particle has broken apart, use your best judgement e.g. measure three lengths and one width for a fragment that has fractured along its length. Make note of the method used for measurement in this case.
10. If you would like to save an image of the measurements overlaid with the image, press F2 to create new layer and save as in step 5.
11. Repeat process for each subsampled particle, recording the length and width on your datasheet.

Example Images

Picture of fiber with scale bar:

Picture of fiber with scale bar and measurements: