1. Goals and Detailed Description

Overall goal: D2.2 has the aim to create scanning electron microscopy (SEM) images of cribellate nanofibers at the calamistrum to be disseminated to a wider public using the project web-site.

As is explained in detail in our recent publication in ACS Nano Materials (https://dx.doi.org/10.1021/acsanm.0c00130), web-weaving cribellate spider catch their prey by a capture wool consisting of nanofibers which are very sticky due to van der Waals forces. With a special tool at its hind legs, the so called calamistrum, the spider combs the capture wool into puffs which are supported by an axial fiber for fixation in the web. To avoid self-adhesion to the sticky nanofibers, the calamistrum is covered with anti-adhesive nanoripples. Ripples of similar size and geometry can be formed by laser-processing on PET foils which then show also low adhesion towards the nanofibers.

In the following, we show SEM images of the spider leg with the calamistrum on top, of a web silk-thread with puffs of capture wool, of anti-adhesive nanoripples at the surface of the calamistrum, of cribellate nanofibers at the calamistrum, and of cribellate nanofibers at laser-induced ripples on a PET foil.
SEM image of the spider leg with the calamistrum on top

SEM image of a web silk-thread with puffs of capture wool
SEM image of anti-adhesive nanoripples at the surface of the calamistrum

SEM image of cribellate nanofibers at the calamistrum (I)
SEM image of cribellate nanofibers at the calamistrum (II)

SEM image of cribellate nanofibers at the calamistrum (III)
2. Evaluation of Goals and Resulting Actions

This report has been published as a public report (PDF) entitled “SEM images of capture wool” in the Dissemination section of the web-site of the BioComb4Nanofibers project (http://biocombs4nanofibers.eu).