**Laboratory assessment for determining microplastics in freshwater systems – characterization and identification along Somesul Mic River**

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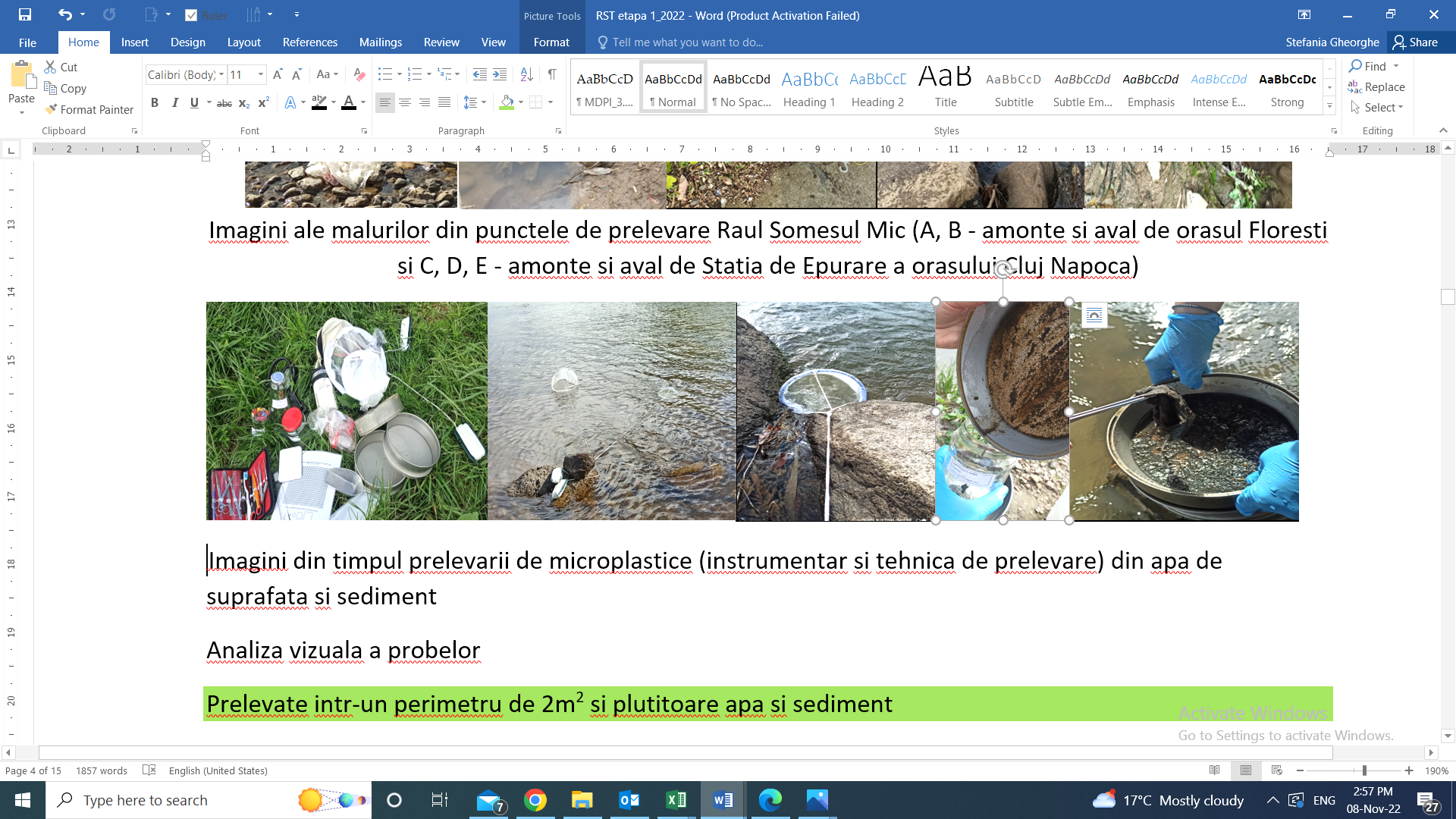
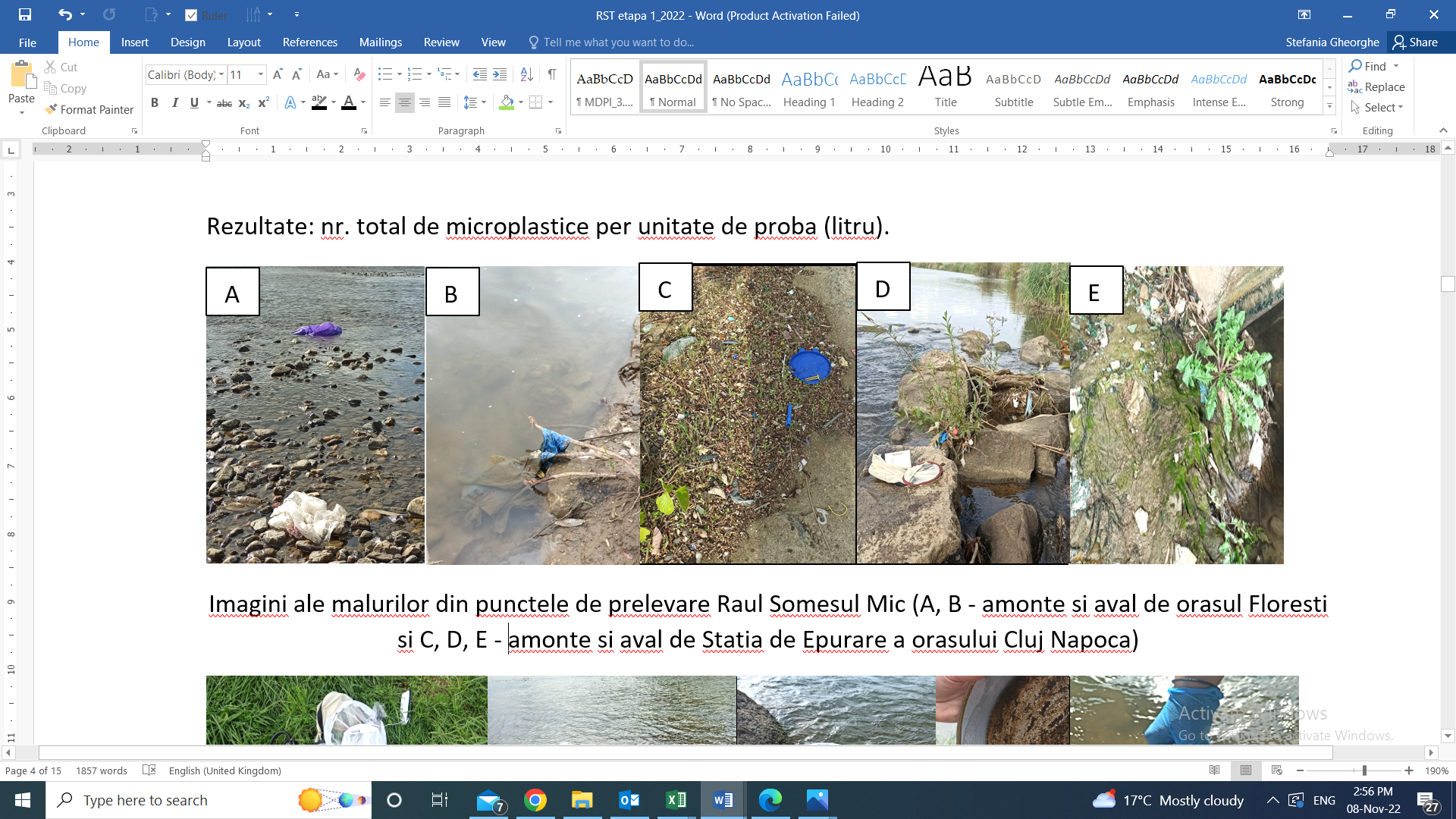


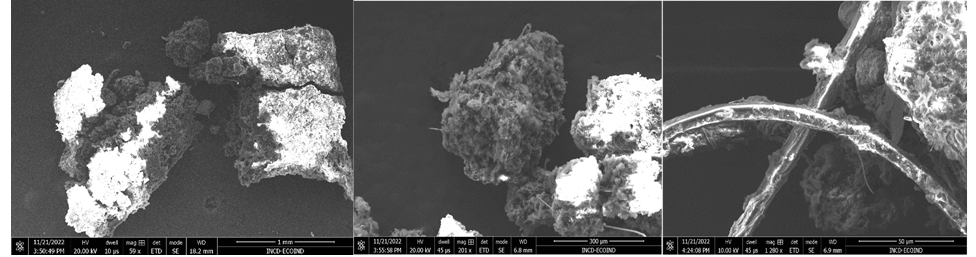
Figure S1. Photos taken during the sampling campaign on Somesul Mic River



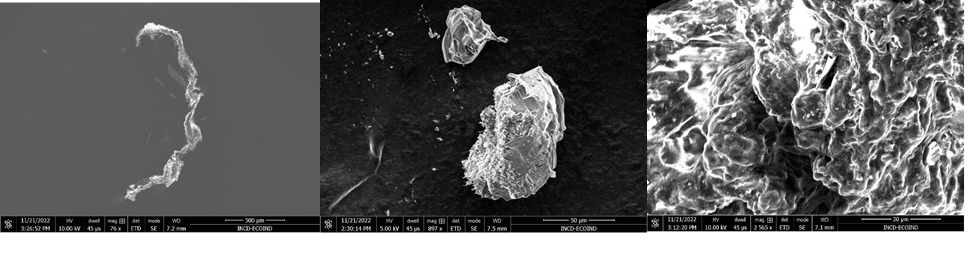
**Figure S2** Images of the river banks taken at the sampling points along the Somesul Mic River (A, B – upstream and downstream of Floresti and C, D, E - upstream and downstream of the Cluj-Napoca Wastewater Treatment Plant)

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| **a)** |
| **C:\Users\Bio\Downloads\VIZUAL AVAL F.png** |
| **b)** |
| **C:\Users\Bio\Downloads\AMONTE VIZUAL STATIE.png** |
| **c)** |
| **C:\Users\Bio\Downloads\VIZUAL AVAL STATIE.png** |
| **d)**  **Figure S3** Visualization of plastic particles - large, micro and macro floating MPs < 1 mm separated from Somesul Mic River (surface water and sediment): **a)** UP Floresti; b) DW Floresti; **c)** UP Cluj- Napoca WWTP; **d**) DW Cluj- Napoca WWTP; **e**) WWTP influent. Each square represents 5mm x 5mm. Four squares together represent 10 mm x 10 mm. |
| C:\Users\Bio\Downloads\Picture3.jpg |

**Figure S4** Visualization of plastic particles in the influent of Cluj-Napoca WWTP. **A**: Each square represents 5 mm x 5 mm. Four squares together represent 10 mm x 10 mm. **B, C, D**: Scale is 3 mm. Particles suspected to be MPs are indicated by black arrows and are smaller than 3-5 mm.

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**Figure S5** SEM images of suspected MPs - decomposing floating MPs



**Figure S6** SEM images of suspected MPs without exposure to digestion treatment, scale bar = 500 µm, 50 µm, 20 µm

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| **Figure S7** ATR-FTIR spectra of the ester cellulose filter membrane |

**Table S1.** Assignment of the ATR-FTIR band exhibited by the filter membrane

|  |  |  |
| --- | --- | --- |
| Peak Number | Wavenumber (cm-1) | Assignment |
| **1** | **2909.7** | stretching vibrations of CH/CH2/CH3 groups[1] |
| **2** | **1750.1** | **C=O** carbonyl stretching [2] |
| **3** | **1625.5** | **C=C** stretching [2-4] |
| **4** | **1428.9** | **CH2** bending vibration [1] |
| **5** | **1368.4** | **CH3** Umbrella bending mode [5] |
| **6** | **1285.3** | **C-O** stretching [6] |
| **7** | **1163.4** | **CF2** stretching vibration [1] |
| **8** | **1071.4** | **C-O** stretching vibration [7] |
| **9** | **1000.4** | **C=C** stretching [7] |
| **10** | **753.5** | **C-H** bending [7] |
| **11** | **684.1** | **C–Cl** stretching vibration[1] |
| **12** | **623.5** | **O-S-O** scissoring vibration mode [8] |

**Table S2.** Assignment of the ATR-FTIR band exhibited by the UP Cluj-Napoca WWTP 200 µm (PE) - Fig. 27

|  |  |  |
| --- | --- | --- |
| **Peak Number** | **Wavenumber (cm-1)** | **Assignment** |
| **1** | **2916** | stretching vibrations of CH/CH2/CH3 groups [1] |
| **2** | **2846.8** | stretching vibrations of CH/CH2/CH3 groups[1] |
| **3** | **1735.2** | **C=O** carbonyl stretching [1] |
| **4** | **1597.5** | **C=C** stretching[2-4] |
| **5** | **1514.6** | **C=C** stretching [2-4] |
| **6** | **1464.5** | **C-H**rocking vibration [6] |
| **7** | **1368.2** | **CH3** Umbrella bending mode [5] |
| **8** | **1248.7** | **C-O** stretching [7] |
| **9** | **1165.9** | **CF2** stretching vibration[1] |
| **10** | **1032.2** | **C-O** stretching vibration[7] |
| **11** | **825.9** | **Si-O** bending vibration[9] |
| **12** | **720.1** | **C-H**rocking vibration [6] |
| **13** | **527.39** | **O-S-O** scissoring vibration mode[8] |
| **14** | **467.67** | **O-S-O** scissoring vibration, [8] |

**Table S3.** Assignment of the ATR-FTIR band exhibited by the DW Cluj-Napoca WWTP 200 µm (PE)- Fig. 28

|  |  |  |
| --- | --- | --- |
| **Peak Number** | **Wavenumber (cm-1)** | **Assignment** |
| **1** | **2913.8** | stretching vibrations of CH/CH2/CH3 groups [1] |
| **2** | **2849.2** | stretching vibrations of CH/CH2/CH3 groups [1] |
| **3** | **1703.3** | **C=O** carbonyl stretching [2] |
| **4** | **1590.3** | **C=C** stretching [2-4] |
| **5** | **1466.6** | **C-H**rocking vibration [6] |
| **6** | **1293.3** | **C-O** stretching [7] |
| **7** | **1168.3** | **CF2** stretching vibration |
| **8** | **1028.6** | **C-O** stretching vibration[7] |
| **9** | **727.4** | **C-H**rocking vibration [6] |
| **10** | **688.1** | **C–Cl** stretchingvibration [1] |
| **11** | **521.1** | **O-S-O** scissoring vibration mode[8] |
| **12** | **464.5** | **O-S-O** scissoring vibration mode [8] |
| **13** | **424.2** | **O-S-O** scissoring vibration mode [8] |

**Table S4.** Assignment of the ATR-FTIR band exhibited by the DW Cluj-Napoca WWTP – 20 **µm** (PE) Fig. 29

|  |  |  |
| --- | --- | --- |
| **Peak Number** | **Wavenumber (cm-1)** | **Assignment** |
| **1** | **2925.2** | stretching vibrations of CH/CH2/CH3 groups[1] |
| **2** | **2843.5** | stretching vibrations of CH/CH2/CH3 groups[1] |
| **3** | **1687.2** | **C=C** stretching [2-4] |
| **4** | **1518.5** | **C=C** stretching [2-4] |
| **5** | **1462** | **C-H**rocking vibration [6] |
| **6** | **1375.6** | **CH3** Umbrella bending mode [5] |
| **7** | **1283.7** | **C-O** stretching [6] |
| **8** | **1232.1** | **C-O** stretching [6] |
| **9** | **1170.7** | **CF2** stretching vibration[1] |
| **10** | **1027.1** | **C-O** stretching vibration[6] |
| **11** | **833.4** | **Si-O** bending vibration[9] |
| **12** | **720.6** | **C-H**rocking vibration [6] |
| **13** | **644.7** | **O-S-O** scissoring vibration mode[8] |
| **14** | **531.5** | **O-S-O** scissoring vibration mode[8] |
| **15** | **470.2** | **O-S-O** scissoring vibration mode[8] |
| **16** | **424.2** | **O-S-O** scissoring vibration mode[8] |

**Table S5.** Assignment of the ATR-FTIR band exhibited by the UP Floresti 200 **µm** (PP) Fig. 30

|  |  |  |
| --- | --- | --- |
| **Peak Number** | **Wavenumber (cm-1)** | **Assignment** |
| **1** | **3024.3** | **-OH** stretching region [6] |
| **2** | **2979.5** | stretching vibrations of CH/CH2/CH3 groups [1] |
| **3** | **2917.8** | stretching vibrations of CH/CH2/CH3 groups[1] |
| **4** | **2845.2** | stretching vibrations of CH/CH2/CH3 groups[1] |
| **5** | **1604.8** | **C=C** stretching [2-4] |
| **6** | **1492.7** | **CH2** asymmetrical vibration [1] |
| **7** | **1453.1** | **CH2** asymmetrical vibration [1] |
| **8** | **1021.4** | **C-O** stretching [7] |
| **9** | **909.2** | **C=C** stretching[9] |
| **10** | **751.8** | **Split CH2** rocking vibration [5] |
| **11** | **690.5** | **C–Cl** stretching vibration[1] |
| **12** | **538.8** | **O-S-O** scissoring vibration mode [8] |
| **13** | **466.2** | **O-S-O** scissoring vibration mode [8] |
| **14** | **420.2** | **O-S-O** scissoring vibration mode [8] |

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