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PRELIMINARY RESULTS REGARDING THE ECOTOXICOLOGICAL EFFECTS TOWARDS COMMON DUCKWEED OF SEDIMENT AND SOIL SAMPLES POTENTIALLY POLLUTED BY MINING ACTIVITIES FROM MOLDOVA NOUA AREA (ROMANIA)

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Abstract: *Due to the former copper mine which created mining dumps that were abandoned after the closure of the mine, the Moldova Noua area is a potentially polluted area by mining activities. The rivers and soils are thus potentially polluted by the mining pollutants, the source of this being the mining dumps from the surrounding area. For the identification of the potential ecotoxic effects of sediment soil samples from this area, a preliminary duckweed growth inhibition test was conducted. In the area of Moldova Noua in October 2020, sediment and soil samples were collected from several sampling points. A preliminary duckweed assay was conducted in order to establish the samples that have toxic effects and for which it is necessary to perform further tests. The preliminary assay involved the exposure of duckweed to the sediment and soil samples, which were diluted with culture media reaching a concentration of 1%, for 7 days. A total number of 10 duckweed fronds were used for testing for each sample. None of the tested samples showed ecotoxic effects to duckweed, some samples showing only a slight reduction of green frond number by the chlorosis of fronds, but no sample showed a significant decrease in green frond number. The information contained in this poster is / will be available in the funding project's Knowledge Base, along with many other important data that are specific to this project, the Knowledge Base being accessible through the following link: http://www.elearning-chemistry.ro/rosnet2/knowledge-base/.*

• Introduction

The Moldova Nouă area is a potentially polluted area by mining activities due to the former copper mine which created mining dumps that were abandoned after the closure of the mine.

These dumps are a source of pollution for the surrounding area, the sediments and soils being potentially polluted by the mining pollutants.

In order to determine if the potentially polluted river sediments and soils have ecotoxic effects, a preliminary duckweed growth inhibition test was conducted.

• Materials and methods

Three sediment samples were collected from three rivers (Boșneag, Radimna and Nera) and four soil samples were collected from different distances from the tailing pond, all from the area of Moldova Noua.

The potential ecotoxic effect of these samples were determined through a preliminary assay which involved the exposure for 7 days of a total number of 10 duckweed fronds.

The samples were tested by adding 0.1 g sediment / soil to 10 mL culture media, obtaining a concentration of 1% (equal to 10 mg/mL or 10000 mg/L).

The preliminary assay also included a negative control (duckweed in culture media) and a positive control (0.5% $ZnCl_2$).

• Results and discussions

None of the tested sediment samples showed an ecotoxic effect towards duckweed as the lowest percentage of green fronds compared to the negative control was of 87% (Figure 1). From the three sediment samples, The Boșneag river sample was the least ecotoxic.

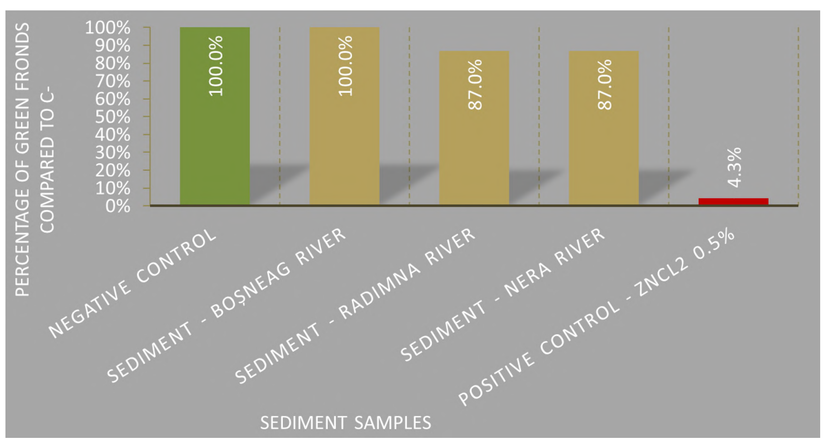

Figure 1. Percentage of green fronds compared to the negative control for each tested sediment sample.

None of the soil samples showed an ecotoxic effect towards duckweed as the lowest percentage of green fronds compared to the negative control was of 81% (Figure 2). It can be observed that the increase in distance from the tailing pond leads to an increase in green frond number (Figure 3).

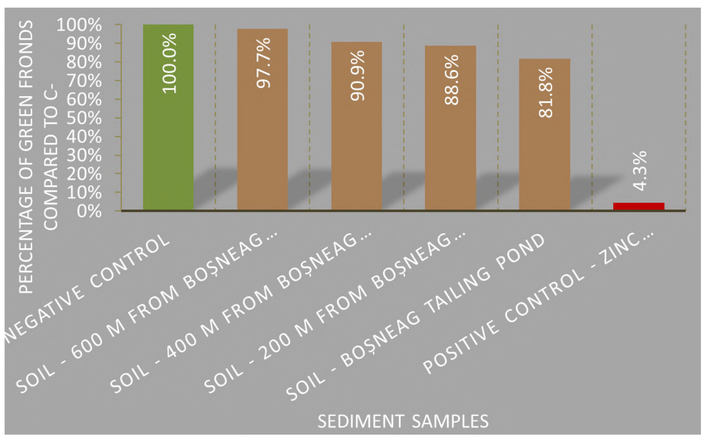

Figure 2. Percentage of green fronds compared to the negative control for each tested soil sample.

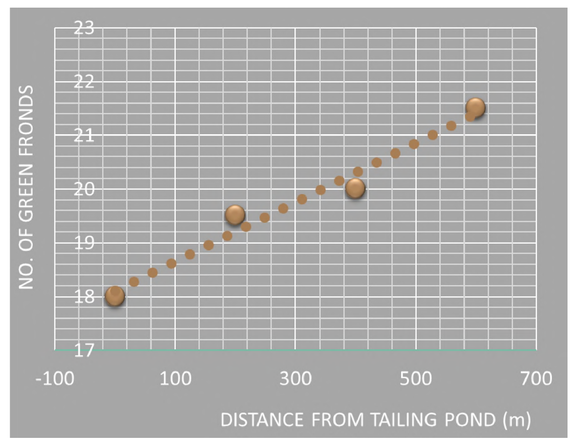

Figure 3. The effect of distance from tailing pond on the number of green fronds for each soil samples

• Conclusions

- None of the tested samples showed ecotoxic effects towards the common duckweed (*Lemna minor* L.).
- Some of the samples showed a slight reduction of green frond number by the chlorosis of fronds, but no sample showed a significant decrease in green frond number.
- An effect of distance from tailing pond was observed on green frond number for the soil samples.
- It was observed that the greater the distance from the tailing pond, the greater the number of fronds.

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