

## Report on the outcomes of a Short-Term Scientific Mission<sup>1</sup>

Action number: **CA18201**

Grantee name: **Mariana Prokopuk**

### **Details of the STSM**

Title: **“Invasive behaviour of alien species of macrophytes (comparative studies in the climate change conditions using the example of *Elodea canadensis*)”**

Start and end date: 10/04/2023 to 10/05/2023

### **Description of the work carried out during the STSM**

Description of the activities carried out during the STSM. Any deviations from the initial working plan shall also be described in this section.

During the STSM, which took place at the Centre for Functional Ecology - Department of Life Sciences, University of Coimbra it was studied the distribution of *Elodea canadensis* in selected Portuguese water bodies. A search of literature sources and herbarium specimens was initially conducted and a database with the distribution of all known records on the territory of Portugal was created. 10 sites on central part of Portugal were selected for further analysis. These 10 sites were visited and the presence/absence of *E. canadensis* was recorded, along with several other biotic and abiotic parameters. Phytomass samples were collected, to analyse production, morphometric, and coenotic parameters. Water samples were collected and analysed for concentration of NO<sub>2</sub><sup>-</sup>, NO<sub>3</sub><sup>-</sup>, NH<sub>4</sub><sup>+</sup>, PO<sub>4</sub><sup>3-</sup> at Laboratório de Química from Agrarian School of Instituto Politécnico de Coimbra. In the field, temperature, pH, conductivity, dissolved oxygen, dissolved solids and redox potential were also measured. In the reservoir where *E. canadensis* was found, we analysed the presence of organisms interacting with it. A literature search was also done on the ecology and invasive behaviour of aquatic plant species, in order to better understand and expanded knowledge about the ecology and invasive behaviour of *E. canadensis* in Portugal, Ukraine and others European countries. Using these data and sources, the invasive

<sup>1</sup> This report is submitted by the grantee to the Action MC for approval and for claiming payment of the awarded grant. The Grant Awarding Coordinator coordinates the evaluation of this report on behalf of the Action MC and instructs the GH for payment of the Grant.

strategy of *E. canadensis* in Portugal was evaluated and a comparative analysis carried out with the data for Ukraine that we already have. Next, we will finalise the data analysis and prepare a joint scientific publication.

### **Description of the STSM main achievements and planned follow-up activities**

Description and assessment of whether the STSM achieved its planned goals and expected outcomes, including specific contribution to Action objective and deliverables, or publications resulting from the STSM. Agreed plans for future follow-up collaborations shall also be described in this section.

Thanks to this STSM, the foundations of collaboration between the Centre for Functional Ecology - Department of Life Sciences, University of Coimbra and the Institute for Evolutionary Ecology of the National Academy of Sciences of Ukraine have been laid, which promotes the exchange of experience and the expansion of scientific cooperation. This STSM allowed familiarizing with Portugal's experience conducting scientific research, management and control of invasive species, which is especially important in the context of the modern implementation of European environmental legislation (primarily, the provisions of the EU Water Framework Directive and EU Regulation 1143/2014 on invasive alien species) into the legislation of Ukraine. Data collected allowed not only to study the distribution on the invasive *E. canadensis*, but also record the presence of several native aquatic plants species with conservation interest, contributing for the objectives of the Action CA18201, namely Working Groups 1 and 3.

The obtained results complemented the current understanding of the distribution of *E. canadensis* in the water bodies of Portugal. *Elodea canadensis* was found in only three reservoirs, and forms dense thickets in only two. The disappearance of this plant from most reservoirs where it used to grow was recorded, and no new invasions were noted in other reservoirs. Based on the results of the field surveys, a preliminary assessment of the regional features of the ecology and invasive behavior of *E. canadensis* was made. The study of morphological plasticity of the species will allow to analyse the reaction of this invasive alien species to its habitat. According to the preliminary comparative assessment, *E. canadensis* is characterized by a lower variability of morphometric parameters in the reservoir of Portugal than in the reservoirs of Ukraine, but it forms larger phytomass. Some water analyses are still going on in the Laboratório de Química from Agrarian School of Instituto Politécnico de Coimbra. After receiving complete hydrochemical data, an assessment of the water quality will be conducted in order to better understand the differences in the reservoirs in which *E. canadensis* was present and absent. In the coming months, a full comparative analysis with data from both countries will be performed and a joint publication prepared.

This work will be the basis for finding the reasons for the decrease in the spread of *E. canadensis*, which distribution is decreasing not only in Ukraine and Portugal, but also in other European countries.