Water-starworts (*Callitriche*) are common, evergreen aquatic plants found commonly in temperate climates worldwide. They inhabit standing and flowing waters and are usually submerged. In research carried out by our team over several years at the Faculty of Biotechnology and Horticulture at the University of Agriculture in Krakow, we have shown that *Callitriche cophocarpa* has an above-average capacity for phytoremediation - the removal of certain highly toxic elements from water, e.g., chromium in a hexavalent form. Research conducted around the world also shows that other species of water-starworts (also found in Poland) have similar properties, removing many dangerous metallic elements from the water environment. Thus, it means that they have a high physiological tolerance to unfavorable conditions of the environment they inhabit.

Homeostasis refers to the autonomous regulation of metabolism, which means how an organism maintains its internal balance despite adverse external conditions. The project aims to create the world's first collection of different genotypes - species and ecotypes of water-starworts, for model studies on metal homeostasis mechanisms in aquatic plants. Transition metals (e.g. Fe, Zn, Mn, Co, Ni, Cu) are present in about 30% of all proteins and are involved in the enzymatic regulation of many fundamental plant life processes, such as photosynthesis and respiration. Transition metals, by their chemical nature are reactive, and therefore they are potentially dangerous in very low concentrations.

The collection will be made up of plants obtained from various sites across Poland. Ultimately, the collection will include 10 carefully selected genotypes. The plants will be characterized in terms of genome size, genetic transformation capacity, and physiological tolerance to selected metallic elements. We will check if cultivation does not cause genetic mutations, and if the selected genotypes are potentially suitable for remediation of contaminated aquatic environments. This will be an *in vitro* collection, as plants grown under such conditions can be multiplied very efficiently on a large scale. In addition, *in vitro* plants are better for modeling purposes. Subjected to controlled bacterial inoculation, they will also become excellent objects for studying the effects of the bacterial microbiome on the maintenance of metal homeostasis in the context of so-called '*phytobial remediation'*. The *Callitrche* collection will be open to a wide range of plant researchers. A website will also be set up, on which those interested in using the cultures in their research will be able to obtain all the necessary information, as well as to ask questions directly to the project contractors. Ultimately, the collection will also become a source of *Callitriche* gene resources for further independent scientific projects on metal homeostasis in aquatic vegetation research in the field of plant biology in the broader sense.