

“Extraction and purification of protein and lipid fractions from the green juice of the halophyte plants.”



Iwona the Université catholique de Louvain is one of 17 partners in the AQUACOMBINE project, what is your main project task?

Our main role in the AQUACOMBINE project is focused on the extraction and purification of protein and lipid fractions from the green juice of the halophyte plants (mainly *Salicornia* spp.) obtained during the so called “green fractionation” of the plants, which separates green fibres from the juice. Additionally, our team is involved in the phytochemicals extraction, purification and analysis, including testing their bioactive properties.

What added value you expect from the project?

When writing the proposal, our main goal was to develop a complete system to process halophytes, starting with cultivation, through fractionation and purification of the fractions obtained, and concluding with final products that could be put to market (such as cosmetics, fish feed or functional foods). It requires a great deal of collaboration among partners coming from different backgrounds offering their expertise and working on different tasks simultaneously. All of the partners are working hard to minimize the use of energy and resources to achieve our goals. The result of this project should offer guidance on growing and processing halophytes to generate valuable products in sustainable and low-to-zero-waste technologies. We believe that the knowledge gained on halophytic plants, their cultivation, composition and processing requirements will help move from using them just as gourmet foods to considering them as substrates for various products.

The four-year project began in October 2019. After two years, can you say what your most surprising result has been so far?

What has surprised us the most, is how different the plants are from everything we were used to work with. Starting with the challenges during the analyses of chemical composition, through the

green fractionation and finishing with the protein and lipid extraction. The reason for these challenges to occur is the extremely rich chemical composition of the plants, which is dependent on the harvesting season and cultivation. The variability opens many new possibilities, but it also causes troubles during process optimization.

Why is this topic so important?

I honestly think that the importance of exploring new, non-conventional solutions for producing food/feed/personal products does not have to be advertised. We all know how important it is to develop sustainable, zero-waste technologies to change our ways and actively reduce our carbon footprint. The consumption of medication and dietary supplements (all not without side effects) is on the rise, and functional, "bioactive" foods and cosmetics can be a start to healthy, more natural living. Also, gaining knowledge in the new, unexplored areas and its dissemination is a great opportunity for development for the involved partners and their teams, and through this, for the UCL – as we are the first team working on halophytes at our University. We have established great collaborations during the project, which I am sure, will continue for years to come.

If you could wish for something for the project, what would it be?

The wish that I think everyone in the project shares with me is that we reach a large audience with our message, and to see our final products being sold on the market.



Iwona Cybulska is currently working as an Assistant Professor at UCLouvain (Faculty of Bioscience Engineering/Earth and Life Institute). Her research focuses mainly on the biorefining of locally available agricultural residues to produce value-added bioproducts. The Université catholique de Louvain, founded in 1425, is a comprehensive university of the French Community of Belgium. It offers degrees and research opportunities to more than 30,000 students in almost all fields of study. The primary goal is to prepare students for their future careers, by helping them grow into inquisitive problem-solvers and open-minded world citizens. Its 22 research institutes, 40 technology platforms, 2 university hospitals, and 3 science parks, which include 2 incubators and host more than 280 companies and 84 spin-offs and start-ups, are a testament to UCLouvain's dedication to conducting fundamental and applied research. They also exercise a cross-disciplinary research approach, founded on a rich research tradition personified by such former professors as Georges Lemaître, the father of the Big Bang theory, and Christian de Duve, winner of the Nobel Prize in Medicine.

In AQUACOMBINE project she is leading WP5. Extraction and purification of protein, lipids hemicellulose sugars from green halophytes. She is also involved in WP4 and WP 6.



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