One of the major challenges of the modern world is to counteract and reduce hunger and poverty in the world through so-called sustainable agriculture. Global food production is growing disproportionately slower than the world's population. According to estimates, in 2050 the number of human populations will exceed 10 billion, which is 34% more than today, and will mainly affect developing countries. Interestingly, according to forecasts, there will be migration of people from rural areas to urban agglomerations and the need to transfer some crops to cities, this will also apply to the cultivation of medicinal plants. As a result, research and investments to improve crop yields under artificial growth conditions will attract more and more attention. There are various plant growing systems that are able to simulate the required natural climate for any particular purpose. In such a system, we can use a biotic or abiotic factor to activate the appropriate metabolic pathways or express individual genes. Finally , a defined and reproducible protocol for maximum production of the plants valuable metabolites could be easy set up under a stable controlled-nutrient and -climatic conditions. Replacing traditional soil cultivation with other alternatives will necessarily be in this context. In addition, climate change and environmental pollution necessitate the reduction of fresh water resources, which in consequence forces many farmers, including medicinal plants plantators, to look for new alternative ways of growing them. One such method is the increasingly used hydro- and aeroponics, including intelligent 'hydrofarms'. Our project involves the development of so-called " milking root technology" in which plants will be grown in hydro- and aeroponics on portable platforms in a solution with appropriately selected parameters and physico-chemical properties in order to wash out valuable metabolites in such a way but not to cause the damage of the plant. Active metabolites diffuse freely from the roots and are simply accumulated in solution. The process can be repeated many times on the same plant. Hydroponic crops cultivated in green houses consume about 5% water and a fraction of the land needed to produce an equivalent amount of products in traditional agriculture. All growth substances necessary for growth of the plant derive from a properly prepared liquid medium. The use of such methods is often directed at the appropriate growth of aboveground parts of plants (lettuce, basil, including fruit such as tomatoes, cucumbers, courgettes, peppers). In justification for the use of these techniques in the production of secondary plant metabolites, it should be taken into account that a liquid environment is not only treated as a source of nutrients, but also as a reaction mixture through which we can affect the metabolic pathways of compounds of interest, e.g. by adding metabolic pathway precursors of desired molecules to improve both their synthesis and recovery. Moreover , producing valuable and delicate pharmaceutical precursors in hydro or aeroponics system could fulfill both the legal and industrial requirements. Such system could provide opportunities for improving the quality, purity, consistency , bioactivity and biomass production of the plant’s bio-compounds on a commercial scale. Getting valuable compounds from the roots has always been a challenge. The use of proper solvents for this purpose is very important. As a standard solvents such as methanol or other quite harmful to humans and the environment such as hexane, ethyl acetate or dichloromethane are used. The project's assumption is also to limit the use of harmful substances, if possible, which is why we will try to replace environmentally aggressive solvents with other solvents from the so-called "green solvents" pool. One of them is the so-called Natural Deep Eutectic Solvents (NADES) and are biological eutectic solvents consisting of two or more natural compounds, one of which usually choline chloride is a hydrogen acceptor and the other hydrogen bond donor are also basic plant metabolites such as carboxylic acids, sugars , alcohols, amines and amino acids. Depending on the components mixed to create NADES, one can extract polar or nonpolar components from plants. One of the methods described assume the use of NADES assisted with ultrasound or microwave, our idea is to use electrical pulses so called Pulse Electric Field (PEF) applications ,as a method supported to facilitate extraction. PEF-assisted technologies are attractive for different applications in food, medicine, pharmacy, cosmetics and biofuel industries. Among numerous examples of Pulse Electric Field (PEF) applications for inactivation of microorganisms, intensification of separation, extraction, pressing, freezing, diffusion and drying or organs regeneration may be mark out. Electric field pulses can make living cell membrane electroporated either reversibly or irreversibly. Electroporation is a method of cell membrane permeabilization that is today widely used in biotechnology and medicine for delivery of drugs and genes into living cells, or for food plants and biomaterial extraction. How this action will affect the roots, whether it will be useful in the process of "milking the roots" and the content of individual secondary metabolites we want to find out.