

Publishable Abstract with the progress achieved in execution Phase IV / 2017 of 2SEE/2014 project (RO14-0019)

Title of the phase (IV/2017): “Inventory, testing and carrying out the biochemical and DNA fingerprinting for the authentication of some selected medicinal and aromatic plant species, herbal food supplements and plant-based pharmaceutical products”

The fourth phase of the project reporting "Molecular authentication of complex herbal food supplements for safety and efficacy" (PhytoAuthent) (contract no. 2SEE / 2014) covered the period 01.01.2017 - 30.04.2017. For this phase of the project, a number of six activities, that involved all four members of the consortium, were planned and successfully implemented. All objectives and target deliverables of each activity were achieved. The theme phase implied the sampling continuation of plant material from studied plant species in order to perform specific analyzes (biochemical and molecular - DNA fingerprinting), to authenticate some species of aromatic and medicinal plants in complex products (herbal food supplement and / or ethno pharmaceutical products). Regularly annual report, which covers issues that may affect the safety of food supplements and ethno pharmaceutical herbal products, was expanded and supplemented with new and updated data. Thus, it was collected herbal material from plant species with ethno-pharmaceutical potential taken into study (*Echinacea sp.*, *Hypericum perforatum*, *Gentiana lutea*, *Veratrum album*, *Veronica sp.* and *Dactylorhiza sp.*), both from the spontaneous flora and cultures (*Echinacea sp.* and *Gentiana sp.*), targeting especially the poorly represented species, and some of the medicinal and aromatic plant species selected were analyzed from the morpho-anatomical point of view. It has been continued the biochemical and chromatographic fingerprinting for herbal material from species of *Veronica sp.*, *Echinacea sp.*, *Veratrum album*, *Hypericum sp.* and *Dactylorhiza maculata*. It was evaluated the effectiveness of DNA extraction protocols for targeted plant species on PCR amplification and it has been chosen the CTAB method due to the proven efficiency and lower associated costs.

After DNA fingerprinting, using Sanger method, four molecular markers (nrITS, matK, psbAtrnH and rbcL) were selected, considered as DNA barcode regions, in order to identify plants species from dry plant material and dietary supplements which contain these plant species. Also, the process of molecular fingerprinting using Next Generation Sequencing (NGS) technology and preparing Ion Amplicon library sequences have been onset.

As part of training, young researchers belonging to the project consortium continued their involvement in the scientific activities, as they were unfold. With the aim to provide the regulators, food chain operators and herbal industry with peer-reviewed, science-based, decision-making tools to analyze and chose from, the obtained project results were published in international scientific journals with high impact factor and disseminated at international scientific conferences, through press releases and on the project website.