

Growing awareness among the public increases the demand for healthy food, dietary supplements and biocosmetics free from artificial colorings, flavorings and stabilizers. However, due to high costs, only a small portion of flavors or pigments is obtained by extraction from plants. On an industrial scale, these substances are primarily produced by chemical synthesis. Therefore, there is a need to develop alternative methods for the production of natural pigments and flavors, including biotechnological processes based on microbial activity. Since more and more accurate strains capable of producing dyes, e.g. carotenoids, or aromatics, e.g. rose volatile are isolated, yeast seems to have a distinguishing potential in this area. Besides, yeast-producing biopolymers that may be used as thickeners and stabilizers in food products or as carriers of biologically active substances in pharmaceuticals are currently the object of interest. An inexhaustible source of microorganisms, including the yeast is the natural environment.

The aim of the research project is the isolation and detailed characterization of novel yeast strains originating from the natural environment, both from plant material and spontaneously fermented food. Next, detailed analysis will be carried out, aimed at selecting strains capable of producing selected metabolites. At the same time, selected yeast strains will be tested for their ability to metabolize low-cost media containing waste from the agro-food and wood industry.

The implementation of activities planned within the project may allow the isolation of new yeast strains from environmental samples with specific metabolic characteristics. This will expand knowledge in the field of environmental microbiology. In particular, a diversity occurring within isolated yeasts and their potential for the production of selected natural pigments, flavors and polymers will be studied. In addition, finding yeasts efficiently producing desired compounds on low-cost media would enable the future use of these strains in the development of cost-effective biotechnological processes. The end result of the project will be the creation of a public collection of yeast strains which interested scientists will have an access to, via the website of the Department of Drug Technology and Biotechnology at the Faculty of Chemistry at WUT. This would be the first widely available collection of yeast strains in Poland, which apart from containing basic data, such as the species of strain and the source it was isolated from, will also include its more detailed characteristic. Additionally, information useful for designing bioprocesses with yeast, such as organic carbon sources the strain can grow on, the optimal growth temperature and other physical and chemical parameters examined in the frame of the project will be attached. Data concerning the ability to grow and produce selected metabolites (mainly dyes, fragrances and polymers, but also ethanol or lipids) on tested industrial waste will also be added. This way, microbiologists and biotechnologists will have access to the mentioned collection and gain access to the yeast strain of their interest.