# Universal Biocomposition for the Enhancement of Oil Recovery from High-Temperature Oilfields (Case Study: Azerbaijan)

Aliyeva, Ayshan

Aliyev, Ali

Existing exploitation methods of oilfields enable the extraction of only about half of oil resources. The goal of this project is to develop a biotechnology-based universal and environmentally safe biocomposition for enhanced oil recovery (EOR) from high-temperature oilfields to achieve sustainable and efficient exploitation of natural oil resources. The novelty aspects of the research are following:EOR in oilfields with temperature higher than 40-42°C in comparison to lower temperature limitations of existing biotechnological methods, geospatial database of oilfields with relevant and optimal biotechnological method depending on geology of wells. The consistency of biocomposition is economically sound because it's developed from bioreagents-wastes of local food and recycling industries and thermophilic microorganisms. Serial laboratory investigations within special laboratory oilwell model allowed to prove efficiency of bioreagents and products of their degradation by thermophilic microorganisms in terms of generation of oil displacement agents (biosurfactants, gases, alcohols, acids) and increased pressure along with separation of oil from sediment contributing to EOR. As a result of conducted experiment, 12-14% of EOR from the laboratory model of oilwell was observed. Quantitative statistical analyses using different consistencies of bio-reagents and oilwell parameters revealed the highest effectiveness of biocomposition in following biotechnological combination: consortium of thermophilic microorganisms, lactoserum, sewage waters from olives procession, yeast production, activated sludge and soapstock. Geospatial oilfields database was also developed for the optimized selection of biocomposition consistency depending on wells geology and local available bioreagents.

**Awards Won:**