

Study of degradation of the genetically modified soybean DNA with the *Escherichia coli* and *Bacillus subtilis* by qPCR method

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A genetically modified organism (GMO) is any organism whose genetic material has been altered using genetic engineering techniques. The number of genetically modified organisms and their consumption annually increases worldwide, GMO organisms are widely used in food production, animal feed, pharmacology and other important fields.

Glyphosate tolerant soybean is the most widely distributed among GM crops that was created by "Monsanto" since 1995, and nowadays it holds 94% from total soy bean what is harvested in the US. Georgian market is filled with animal feed which containing GM soybean. Because the Georgian legislation does not regulate the management of GMO waste, it's permanently spreads in the environment.

It is well known that the GMO waste in the environment is a recombinant DNA source which is a potential threat to the horizontal gene transfer. There is little information on the recombinant DNA degradation by soil microorganisms.

Proceeding from the above, the aim of the study was to determine degradation of the recombinant DNA by various microorganism. Several step experiment was conducted. Firstly, we've chosen *E.coli* as one of the most well-researched organisms in biological studies and *B.subtilis* as one of the most widely spread and well-studied microorganisms in the environment.

The recombinand DNA degradation and horizontal gene transfer were studied by traditional and modern biotechnological methods. We cultivated chosen microorganisms on the media which contains GM soybean, in the constant shaking conditions for 96 hours. Every 24 hours we were taking the samples from bacterial media. Also we added as kanamycin and glyphosate as stimulating factors. Next step was extraction of DNA from this microorganisms and screening on the GMO markers p35S and TNOS.

According to the results, we can conclude that *B.subtilis* showed high levels of DNA degradation than *E.coli*. We didn't detect horizontal gene transfer between GM soybean and bacteria by our methodology. The different construction of the recombinant DNA showed different stability against bacterial degradation.