Name(s)

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Project Number

J0516

Project Title

Which Has More DNA Degradation: Organic or Non-Organic Plant Produce?

Abstract

Objectives

The goal of this project is to investigate whether Organic produce or Non-organic produce has more DNA degradation under the same conditions. This is to determine if the chemical treatments used on Non-Organic crops have an effect on the produce s DNA.

Methods

Agarose Gel Electrophoresis process was used to visualize DNA double-strand breaks.The DNA extraction began with macerating spinach and celery down to a powder by a bead beater and the powders were mixed with 1% PVP buffer to make sure maceration wouldn t cause additional DNA Damage. RNase A and Proteinase K were pipetted into the solutions and were incubated. The solutions were purified, and the remnant DNA was mixed with glycerin dye and inserted into the Agarose Gel. Since DNA has an overall negative charge, a positive charge is put at the end of the gel so the DNA will move towards that end.

Results

Results showed that non-organic spinach produce has a lower rate of DNA degradation than organic spinach under the same conditions and over the same period of time.

Conclusions

After observing that non-organic plant produce has less DNA degradation compared with organic produce under the same conditions, we can infer that the chemical treatments used on non-organic produce might have an effect on the DNA. Other reasons for the decreased DNA degradation in non-organic plant produce are not fully discovered. Some of the causes could be changes in enzymic activity, changes in apoptosis (cell suicide) rates, etc which can be part of continuing research. Findings from these experiments potentially could also be stepping stone towards future research for understanding any detrimental effect on humans by consuming plant produce with damaged DNA and to establish healthier and more environmentally friendly alternatives for treatment of plant produce.

Summary Statement

Using the process of Agarose Gel Electrophoresis, I observed that Organic Spinach has more DNA degradation than Inorganic Spinach under the same conditions.

Help Received

Thankful to Dr. Brian Dorsey for mentoring and giving access to his laboratory