CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)
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Project Number
J0515

Project Title
Ripe vs. Spoiled

Abstract

Objectives/Goals
My science experiment is determining which stage of ripening (ripe or spoiled) from fruits and vegetables obtains more extractable DNA.I am verifying whether these levels of maturity affect their quantity of DNA.In addition, my science fair experiment will demonstrate how DNA can be extracted with a simple detergent, and how ethylene helped with the ripening of the fruits and vegetables.I predict that ripe fruits and vegetables contain more extractable DNA than the spoiled ones.

Methods/Materials
I am extracting DNA from five fruits and five vegetables in their two stages of ripening - ripe and spoiled, with two samples of the same fruit/vegetable under each stage. That is forty fruits and vegetables total (twenty fruits and twenty vegetables).First, the fruit is broken up into a pulp, so that the cells seperate from each other, giving them away to the extraction solution. Then, the detergent is mixed with the pulp, to release the DNA from the membranes, and the mixture is filtered to set the DNA apart from the remains of the membranes. Lastly, the DNA becomes visible by precipitating it with alcohol.

Results
My results stated that fresh fruits and vegetables had an average of 18.07 milliliters of DNA, and the spoiled fruits and vegetables had an average of 26.3 milliliters. This means that spoiled fruits and vegetables have 45.5% more DNA than fresh ones.

Conclusions/Discussion
The reason for my results in my science fair experiment is ethylene and the ripening process that both fruits and vegetables encounter. Ethylene is the factor for the process that all fruits and vegetables undergo # ripening. As the ethylene took affect, pectinases (an enzyme that arranges the transmogrification of pectin into sugars and galacturonic acid) broke down the cell walls and softened the fruit and vegetable.When the cell walls break, it is easier for them to release their DNA, which is held inside the nucleus, and makes it easier for me to mash the fruit or vegetable and extract the DNA. Under-ripe fruits and vegetables do not produce as much enzymes, so they relinquish less DNA.This experiment relates to the real world by offering an introduction to molecular biology and agricultural manufacturing.

Summary Statement
Determining the quantity of DNA pertaining to the two stages of Ripening from fruits and vegetables.

Help Received
Materials provided by Rincon Middle School.