CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY

Name(s)
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Project Number
J0411

Project Title
Extracting Apple Juice with Pectinase and Cellulase

Abstract

Objectives/Goals
The objective is to determine what combination of Pectinase and Cellulase will produce more apple juice in my experiment.

Methods/Materials
Materials:Apples, Sharp knife for cutting apples, Balance for weighing out apple pieces, Pectinase and Cellulase (available at Carolina Biological), Strainer, Disposable plastic spoons for stirring, Two 1 mL syringes, Three small funnels, Three 100 mL graduated cylinders, Three 100 mL beaker, Water bath, Distilled water, Timer or clock.
Methods: Chop the apples into cubes that are roughly 5 mm on a side. Use the balance to weigh equal amounts of chopped apple (about 50 g) into each beaker. Prepare Pectinase and Cellulase enzyme according to the manufacturer's instructions. Use the syringe to put the amount of Pectinase and/or Cellulase in the beaker according to the results chart. Stir the chopped apple pieces in each beaker with a separate plastic spoon. Be sure to wet all of the pieces. Put both beakers into a 40°C water bath for 15#20 minutes. With water at 40°C, the water should come up to the level of the chopped apples, but you don't want so much water that the beakers float and tip over. Take the beakers out of the water bath. Put the funnel on top of the Graduated cylinder. Now put the strainer on top of the funnel. Pour the apples onto the strainer and record the amount of juice produced.

Results
When I tested with Pectinase only the results showed that it produced about 14ml of juice. When I tested with Cellulase only the results showed that it produced about 11ml of juice. When I tested with equal amounts of Pectinase and Cellulase the results showed that it produced about 20ml of juice. When I tested mostly Pectinase the results showed that it produced about 17ml of juice. And when I tested mostly Cellulase the results showed that it produced about 15ml of juice.

Conclusions/Discussion
In my experiment I tested to see if the right combination of Pectinase and Cellulase would produce the most amount of apple juice. In my experiments I tested; Pectinase only, Cellulase only, Equal amounts of Pectinase and Cellulase, Mostly Pectinase, and Mostly Cellulase. I conducted each of these tests three times in order to get the most accurate results. My test results proved that equal amounts of Pectinase and Cellulase produced the most apple juice. These test results support my Hypothesis

Summary Statement
In my experiment I tested to see if the right combination of Pectinase and Cellulase would produce the most amount of apple juice.

Help Received
Mother helped supervise; My teacher, Mrs. Mchale, for helping me obtain my Chemicals.