

Dna extraction of a kiwii

Literature, Russian Literature



DNA Extraction from Fruit 1. What was the purpose of adding liquid soap and salt in step #1 and how does NaCl contribute to maximum DNA extraction. The purpose of using soap was to destroy the membranes inside a kiwi cell. Soap helped with that because it dissolves the membranes easily. Salt or NaCl was used to remove proteins and carbohydrates. NaCl caused the proteins and carbohydrates to precipitate. 2. Why was it necessary to “mush” the kiwi by hand? If the step was omitted, what effect would this omission have had on the results? The Kiwi was mashed by hand in order to break the large pieces of fruit and to increase the surface area of the cells. If this step was omitted, the complete degeneration of proteins, carbohydrates and other cell components would be difficult and that would produce less concentrated DNA. 3. Why do we heat the resulting fruit mixture and then cool it? The resulting mixture was heated because high temperature breaks down the cell walls exposing the cell membranes. This allows the detergent to dissolve the fatty cell membranes. 4. Why would 90% isopropyl alcohol be even better than using 70% isopropyl alcohol in this procedure? Alcohol was used to concentrate the DNA and get rid of the salt and other chemicals used in the extraction process. DNA is insoluble and this causes the DNA to precipitate. If 90% isopropyl was used instead of 70% isopropyl alcohol, more concentrated and purified DNA would be created. 5. DNA was spooled out using a glass rod. How do you account for the “stickiness” of DNA to glass? The salt used in the extraction process caused the DNA to stick together. The insolubility of the DNA in alcohol caused it to coagulate to form a sticky jelly like substance that can be picked up by a glass rod. 6. Describe the DNA that you extracted. If DNA is a rigid structure, why do the DNA

strands appear flexible? The DNA is a clear jelly like substance and is grouped together. They appear flexible because DNA exists in a helical structure and the coiled form of DNA allows it to be flexible yet rigid at the same time.

7. What does it mean to purify a molecule? Comment of the purity of the DNA extracted. To purify a molecule is to remove everything but that molecule. In this experiment, all parts of the cells besides the DNA, i. e. cell wall, cell membrane, mitochondria, Golgi apparatus, vacuoles, etc. are removed and the DNA is isolated.

8. Describe (2) practical applications of this laboratory activity. DNA extraction is the basis for genetic engineering and one example is DNA fingerprinting. This process is used to solve crimes to a degree of near certainty. This is extremely useful because the amount of genetic material needed to be recovered from a crime scene is minimal, even a single strand of hair can determine many things. Another example is purifying DNA in transgenic crop science. This is a study of creating crops that have desirable traits for harvest.