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School of Maths & Science
Science Practical

DNA From Caviar Simple Extraction Of DNA From Fish Eggs

◆ Aim

Extraction of DNA from fish eggs.

◆ Introduction

This simple practical procedure allows the isolation of impure DNA from 'caviar' or fish eggs. The result is a pellet of thread-like material, which includes DNA but will still be contaminated with lipids, carbohydrates and proteins. Nevertheless, samples prepared in this way are sufficiently clean to be 'run' on an electrophoresis gel, producing a 'smear' of DNA and RNA fragments of different sizes when stained.

◆ Safety

Control Measures

- The wearing of **safety goggles** and a **laboratory coat** at all times will be sufficient to take account of most hazards and significant risks.
- Ethanol is harmful by inhalation and in contact with the skin, avoid inhalation and contact with skin.
- Keep flammable liquids away from sources of ignition.
- All waste is to be placed in the labelled container immediately after use.
- You are reminded of the need for good laboratory practice in order to maintain a safe working environment.



Hazards



Highly Flammable

Ethanol

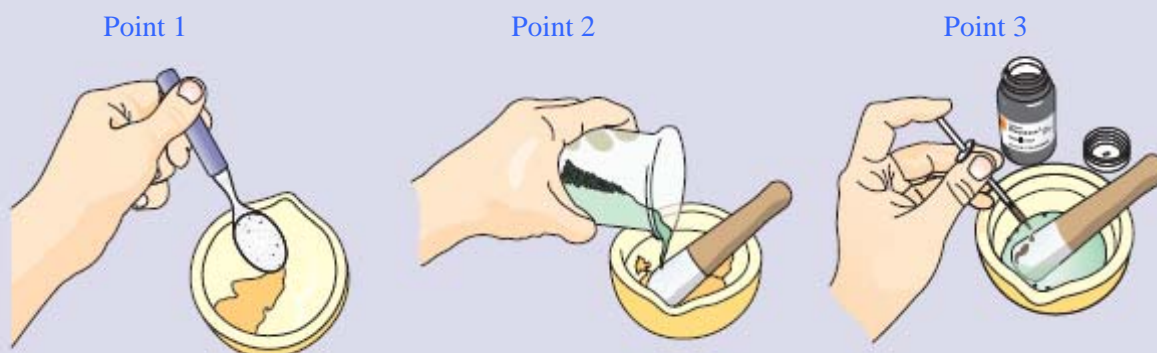


Harmful

Ethanol
Protease enzyme

◆ Procedure

1. Add 15g of caviar and 6g of salt to a mortar and crush the eggs using a pestle.
Note:- the shells of the eggs have to be broken.
(Na^+ ions in the salt bind to the phosphate groups of DNA, neutralising the charge of DNA. NaCl allows the ends of DNA to come together and makes it easier to precipitate out of solution when alcohol is added later).
2. Add 15cm³ of washing up liquid solution to the mortar and mix for 1 minute. The liquid should cover the caviar completely *(the detergent dissolves lipids from the membranes of the roe).*
3. Add 5 drops of Novozymes Neutrase[®] to the mixture and stir vigorously for 1 minute *(the enzyme will partially degrade any soluble proteins).*



4. Add 30cm³ of de-ionised water and gently stir to mix *(this dilutes the liquid for ease of filtering).*
5. Filter the mixture through the coffee filter and collect the filtrate in a clean test tube.
6. Add 2cm³ of ice-cold ethanol by carefully pouring it down the side of the test tube. *(DNA precipitates as long threads in cold ethanol and can be found at the interface between the detergent solution and the ethanol).*
7. Collect the DNA with the help of a Pasteur pipette with a hooked tip. *(The DNA may be transferred to a microcentrifuge tube and stored, frozen, for later use e.g., for gel electrophoresis or staining of the DNA).*

