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RESEARCH ARTICLE

ISOLATION, QUANTIFICATION AND PURITY ESTIMATION OF DNA FROM VARIOUS SOURCES

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DNA was isolated from various sources such as bacteria, fungi, blood, fish tissue and onion. The entire DNA that has been extracted was found to differ in their molecular weight and was seen as separate bands when viewed under UV light. The concentration of the DNA was estimated by using the UV spectrophotometer. The concentration of DNA was found to be more from onion and the ratio of their absorbance at 260 and 280 nm, was 1.9 which showed slight contamination. The concentration of DNA was found to be the least from fungi and ratio was found to be 1.58 indicating the presence of contamination. The DNA which was isolated from the bacteria and blood was found to be 100% pure and free from contamination.

Key words: DNA isolation, Blood, Fish tissue, Onion, Bacteria, Yeast.

INTRODUCTION

Deoxyribonucleic acid is a genetic material which can able to store the information which has to be transferred from one generation to another. Methods used to isolate the DNA depend on the source, age and size of the sample. Principle behind the separation of DNA which is present in the cells is to make the DNA free from the other cellular components (Saenger, 1984). Isolation of DNA is needed for the genetic analysis, which is used for scientific, medical or forensic purpose. Scientists use DNA in a number of applications, such as introduction of DNA into the cells and animals or plants, or for diagnostic purposes. In medicine, diagnostic purpose is the most common. Forensic science needs to recover DNA for identification of individuals; for example rapists, petty thieves, accidents, or war victims, paternity determination, plant and animal identification (Bruce *et al* 2002).

Presence of proteins, lipids, polysaccharides and some other organic or inorganic compounds in the DNA preparations can interfere with DNA analysis methods, especially with the polymerase chain reaction (PCR). They can also reduce the quality of DNA leading to its shortest storage life (Bauer and Patzelt, 2003). Sources of DNA isolation are very diverse. Basically it can be isolated from any living or dead organism. Common sources for DNA isolation includes the whole blood, hair sperm, bones, nails, tissues, blood stains, saliva, buccal (cheek) swabs, epithelial cells, urine, paper cards used for sample collection, bacteria, animal tissue or plants (Mandelkern *et al* 1981). It is quite clear that the extraction methods from various sources have to be adopted in such a way that they can be efficiently purified. Another important factor is the sample size. If the sample is small, as for example, sperm or single hair, the method has to be different to the methods used in isolating DNA from a couple of milligram of tissue or milliliters of the blood. Another important factor is whether the sample is fresh or has been stored. Stored samples can come from archived tissue samples, frozen blood or tissue, exhumed bone or tissues and ancient human, animals or plant samples (Gregory, 2006).

Isolation of DNA usually begins with lysis or breakdown of tissue or cells. This process is