I. INTRODUCTION

1.1. STATEMENT OF THE PROBLEM

Today, crime is being committed in more sophisticated methods and in an organized manner. In addition, new types of crime are continuously taking place. To efficiently handle with such situations, investigative authorities also rely on systematized and scientific investigative methods. DNA technology is one of the investigative tools in recent times after the pioneering work done by Professor Sir Alec Jeffreys in Leicesters University, London in 1985. Before 1980’s, DNA was used for scientific research and scientific purpose only. Now, it has gained a prominent role in forensic science. Forensic science, as a scientific method, working within the constraint of the legal system, affords guidelines to civil and criminal investigations besides giving accurate information about all the attending features of identification of criminals. The origin of DNA technology improves the status of forensic science from passive to active key player in the administration of justice.

DNA or Deoxyribonucleic acid is a genetic blueprint of every human being. The chemical component of DNA in the cells of each individual is unique. This is the sole determining factor to identify one separately from another except the ‘genetically identical twins’. The innovation of the said science can be used to identify criminals with an incredible accuracy when biological evidence is recovered at the crime scene. At the same time it can also be used to exonerate persons mistakenly accused or convicted of crimes. For that reason, DNA technology is considered to be the best one to find out the truth. Former Justice Markendey Katju, in his book Law in the Scientific Era,¹ said:

‘Science has, no doubt, existed since ancient times. But in earlier age, science (ie the study of nature’s law) and technology (ie the application of these laws for producing socially useful goods) were almost independent activities, having no interlink. Engineering developed at that time largely independent of science and was guided by experience and tradition. It is only in the modern age that science and technology have become closely interlinked, and the gap between them has narrowed down. The result of scientific discoveries and technical inventions accelerate the rapid progress of both science and technology

¹ Borrowed from Jothirmoy Adikari, DNA Technology in the administration of Justice, Lexis Nexis Butterworths, 2007, P.4
and the radical transformation of society. Moreover, in the modern scientific era, subjective knowledge based on experience is largely replaced by objective experimental deterministic knowledge that minimizes chance and probability factors and ensure certainty in our lives.²

Like that, the application of DNA technology ensures fairness in the criminal justice system. In fact, the usefulness of DNA technology has played an important role in the investigation of crime. Some of the uses are:

(a) Identification of convicts in sexual assault cases,
(b) Identification of convicts in murder cases,
(c) Identification of paternity and maternity of the child,
(d) Identification of mutilated remains,
(e) General identification of criminals, and
(f) Immigration purposes.

(a) Identification of convicts in sexual assault cases: DNA evidence is very useful in sexual assault cases. Immediately after the incident of rape, the biological evidence recovered at the crime spot or the sample collected from the victim’s body is compared with that of the samples collected from the suspect through the use of DNA technology. The results of comparison may help to establish whether the suspect has committed the rape or not. If the suspect has committed rape, it can be established with a greater accuracy.

(b) Identification of convicts in murder cases: In murder cases, the DNA technology is used to identify the real culprit who has committed the crime. The accused who committed murder may often leave some biological evidence at the crime scene like blood stains, hair roots, and bodily fluids. In many times blood stained articles like weapon, sword, and blood stained clothes of the victim may be seized from the possession of the accused. All these material evidences are useful for DNA analysis, which indicates the presence of the accused on the crime spot.

(c) Identification of paternity and maternity of the child: Generally all persons inherit DNA pattern from their biological parents. If the paternity or the maternity of the child is disputed, the mere comparison of DNA obtained from the father or the mother with that of the child can offer a foolproof with a greater accuracy.

² Borrowed from Jothirmoy Adikari, DNA Technology in the administration of Justice, Lexis Nexis Butterworths, 2007, P.4
And sometimes the female baby is exchanged for a male baby in hospitals. In such a case, DNA test solves the problem. The real parents of the baby can be identified by DNA test. Similarly, the identification of a missing person or a deceased person can also be identified through the use of DNA Technology. For instance in India, DNA identification was made to identify the parentage of children missing from their parents during the tsunami attacks in December 2004.

(d) Identification of mutilated remains: In India, DNA technology was used to identify the mutilated remains of the victim and the suspect who died in Rajiv Gandhi Assassination case in 1992. It was also used to identify bodies recovered from mass graves in Gujarat, after the Hindu-Muslim riots in 2002. It was also used to establish the identity of victims who died in twin tower attacks in the United States of America in 2001.

(e) General identification of criminals: Sometimes the police may arrest many persons on the suspicion that the crime has been committed by any one of them. During that occasion, some biological evidence recovered by the police at the crime spot or from the victim can be compared with suspects through the use of DNA technology in order to identify the real culprit. In fact, DNA technology is not only to identify the real culprit but also to exculpate the innocent suspect if he/she is not indulged in crime.

(f) Immigration purposes: DNA testing is often utilized in family based immigration cases where a United States resident or citizen wishes to sponsor a relative for admission into the United States. In such cases, the sponsor and their relatives are required to prove their biological relationship through DNA testing (paternity test, maternity test, and family relationship test). DNA testing ensures that international applicants who are fraudulent can be identified and prevented from entering the nation. Most developed countries use DNA test for the support of immigration process.

Thus DNA technology is of immense use under the criminal justice system and it is being effectively used all over the world. In the criminal investigation, DNA is mainly used to link the criminal with a crime. And moreover, DNA is considered to be a powerful weapon against a crime because of its objectivity, scientific accuracy, infallibility, and impartial character.

\[\text{Available at http://genetica.com/GeneticaWebV2.nsf/XImmigration.xsp , viewed on 18/05/2014, at 7.30pm}\]
Because of the uniqueness and its uses for identification of person with a greater accuracy in crime detection, most of the developed countries have applied the DNA technology to their investigation to find out the real culprits especially in the United Kingdom which is the birth place of DNA technology and the United States of America which contains the largest DNA database in the world. The United Kingdom enacted Criminal Justice and Public Order Act, 1994. The United States of America enacted DNA Identification Act, 1994.\(^4\) In India, some provisions relating to DNA testing is incorporated under Criminal Procedure Code 1908, Indian Evidence Act 1872 and the Prevention of Terrorism Act, 2002. Both the United Kingdom and the United States of America have DNA databases to store offender’s DNA profile, arrested person’s DNA profile, unidentified dead body’s DNA profile, missing person’s DNA profile and crime scene evidence DNA profile for their future reference. Generally the United Kingdom and the United States of America use DNA to solve crimes in any one of the ways:

1. Where a suspect is identified, a sample of that person’s DNA can be compared to the evidence from the crime scene.

   Or

2. Where a suspect has not yet been identified, biological evidence from the crime scene can be analyzed and compared to offender’s profile in DNA database.

   Or

3. Crime scene evidence can also be linked to other crime scene evidence DNA profile in DNA database.

At the same time, the DNA technology can also be used for the prevention of future crime. For example, assume that a person is convicted for rape. At the time of his conviction, the accused is required to provide a sample of his DNA, and the resulting DNA profile is entered into a DNA database. After several years, again another rape is committed by the same person. The medical examiner collects the biological evidence from the rape victim and the evidence is tested. The resulting profile is compared with the DNA database which has already been stored. Suppose it is matched with the earlier profile, then the accused will be arrested, tried, and sentenced for his second crime. In this method, the person is

\(^4\) Title 42 United States (U.S) Code Section 14132
prevented from committing another crime due to the fear of biological sample which has already been stored.

The police in Columbia, South Carolina, have released a sketch of a possible suspect in January 2015. Rather than an artist’s rendering based on witness descriptions, the face was generated by a computer relying solely on DNA found at the scene of the crime. It may be the first time a suspect’s face has been put before the public in this way, but it will not be the last. Investigators are increasingly able to determine the physical characteristics of crime suspects from the DNA they leave behind, providing what could become a powerful new tool for law enforcement.\(^5\)

In any legal system, the introduction of new scientific technology has created serious challenge to legal and fundamental rights of an individual such as ‘Right to Privacy’ and ‘Right against self-incrimination’. And this is the most significant reason why courts sometimes are hesitant in accepting the evidence based on scientific method. In such a situation, the judiciary has to balance science and law as well as to balance the societal interest and an individual’s interest. In India, the DNA is considered to be one of the circumstantial evidences.

1.2. REVIEW OF LITERATURE

Selective literatures that the researcher came across in the process of the research are presented here under. The detailed list of the same is enlisted in the bibliography.


This book presents the exposition of new science relating to DNA technology in the administration of justice. This book is divided into six chapters. The author expresses that the currently developing techniques of DNA profiling promise a degree of accuracy greater than the current methods of finger printing suspects. He further explains the uses of DNA technology in civil and criminal investigation. The data available upto 31\(^{st}\) December 2005 have been duly

\(^5\) *The Times of India*, Chennai, 26/02/2015, P.13
incorporated in this book. It narrates the scientific explanation of DNA, methods, and procedural formalities of DNA fingerprinting. It contains three main methodologies namely Restriction Fragment Length Polymorphism (RFLP), Polymerase Chain Reaction (PCR), and Short Tandem Repeats (STR). The procedure for collection of biological materials for DNA test, preservation of biological sample, and documentation process has also been clearly explained. It focuses on the response of the Indian legal system in adopting scientific DNA evidence in the administration of justice. It also explains the development of DNA fingerprinting as a latest tool of forensic science in international perspectives.


This book is divided into six chapters. The author explains the basic theoretical aspects of DNA fingerprinting in forensic setting. The merits and demerits of recent DNA identification techniques like mtDNA analysis and Y chromosome DNA analysis have been explained. The admissibility of the DNA evidence has been discussed. The author has focused mainly on the United States of America. The author has also dealt with the admissibility and the probative value of DNA evidence in India. The author comments that the Indian judiciary is less equipped with tools to screen the scientific evidence like DNA typing. The author further focuses on forensic analysis in criminal investigations, constitutional and legal issues.


This book contains all the aspects of forensic and scientific investigation of crimes. The modern developments have changed the role of investigation to forensic science. The importance of DNA profiling in all aspects, and the nature of DNA and its structure have also been explained. Basic clue materials for DNA profiling have been explained. Two main analyses have been analyzed in this book. They are Restriction Fragment Length Polymorphism (RFLP) and Polymerase Chain Reaction (PCR).


This book contains 85 chapters. Chapter 68 is about the implications of DNA testing implications in civil and criminal investigation. It deals with genetic
variation at the DNA level, its utility as a biological identifier and its importance in civil and criminal investigation.


This book deals with history of forensic science. It explains all the forensic methods. DNA fingerprinting is one of the recent advancements in forensic science. It generally discusses about DNA fingerprinting, sources of DNA and DNA profiling technique. It also analyzes about the prospect of DNA fingerprinting in India and forensic applications of DNA test. It mainly deals with the paternity issues.


The author explains the impact of DNA fingerprinting on the administration of justice. The author also explains the importance of DNA fingerprinting in criminal investigations. The author also expresses that the quality of criminal justice system in India shall be highly upgraded if DNA technology is applied properly.


This article narrates DNA profiling technology. European courts, the United States and Asia have frequently availed of DNA evidence in deciding cases. In India, the DNA test plays a vital role in paternity testing. The author appraises the judgment of Supreme Court in *Sharada v. Daharmpal*. In this case, the Supreme Court has taken a very positive view regarding the importance and the admissibility of DNA evidence. The author discusses section 112 of Indian Evidence Act, 1872. The author narrates that DNA is a tool for identification in criminal cases. A variety of offenses such as rape, murder, and extortion with armed robbery and drug trafficking yield themselves to the application of DNA technology. The author expresses that judges are responsible for the application of DNA evidence. The judges must receive training for the proper assessment of DNA technology. The author hopes that the DNA profiling bill of 2007 which is pending in parliament is expected to be considered and become a law sometime in near future.

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6 AIR 2003 SC 3450
8. **DNA profiling — Wikipedia, the free encyclopedia.**

   This article explains about DNA profiling. DNA profiling is a technique employed by forensic scientists to assist in the identification of individuals by their respective DNA profiles. It also contains DNA profiling techniques. These techniques are RFLP analysis, PCR analysis, STR analysis, AmpFLP analysis, family relationship DNA analysis, Y chromosome analysis, and Mitochondrial analysis.

9. **What is DNA? — Genetics Home Reference.**

   This website “Genetics Home Reference” provides consumer-friendly information about the effects of genetic variations on human health. This website contains the explanation for DNA, gene and chromosome. The genetic information of DNA has been discussed in this website.


    It is a legal website. Many cases have been downloaded from this website. Some of the downloaded cases are:

    (a) *H. M. Prakash Alis Dali v. State of Karnataka,*

    (b) *Miss Swati Lodha v. State of Rajasthan,*

    (c) *State of Bombay v. Kathi Kalu Oghud,*

11. **Genetic Witness: Forensic uses of DNA tests, July 1990.**

    This report “Genetic Witness: Forensic uses of DNA tests” was prepared by the United States Congress, Office of Technology Assessment, on the request made by the Senate Committee on Labor and Human Resources, the United States of America. The assessment evaluated the scientific, legal and ethical issues surrounding forensic applications of DNA tests.

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7 Available at en.wikipedia.org/wiki/DNA_profiling, viewed on 24/07/2013 at 08:45 pm
8 Available at glr.nlm.nih.gov, viewed on 21/05/2013 at 09:30 pm
9 2004 (3) KarLJ 584; Available at http://indiankanoon.org/doc/1502997/, viewed on 09/05/2013 at 08.15am
10 1991 CriLJ 939; Available at http://indiankanoon.org/doc/1147672/, viewed on 23/06/2013 at 02.30pm
11 AIR 1961 SC 1808; Available at http://indiankanoon.org/doc/1626264/, viewed on 15/08/2012 at 6.30pm
12 Available at http://www.fas.org/ota/reports/9021.pdf, viewed on 08/05/2012 at 12.22am.
12. **National DNA Database Strategy Board – Gov.uk.**¹³

This report “National DNA Database Strategy Board Annual Report 2012-13” is forwarded to the Home Office, the United Kingdom by the Strategy Board, National DNA Database (NDNAD). The report contains the whole year (2012-13) annual progress of National DNA Database, the United Kingdom.

13. **DNA Fingerprinting and Society.**¹⁴

This research paper contains 5 chapters. It deals about DNA fingerprinting. It narrates the DNA structure, types of DNA fingerprinting and forensic applications. It also deals about DNA forensics.

14. **Toward a Comparison of DNA Profiling and Databases in the United States and England.**¹⁵

This report “Toward a Comparison of DNA Profiling and Databases in the United States and England” is prepared by the RAND Corporation. It is a nonprofit institution that helps improve policy and decision making through research and analysis. This report is a comparison of DNA profiling and DNA Databases in the United States and England.

1.3. **OBJECTIVES OF THE STUDY**

The present study is to assess and evaluate the following:

1. To examine the development of DNA technology and its applications not only in crime prevention but also in identification of criminals as well as exclusion of innocent suspects.
2. To study the constitutional validity for conducting DNA test in criminal cases under Article 21 and Article 20(3) of the Indian Constitution.
3. To critically evaluate the role of Judiciary for admitting DNA technology in criminal cases in India.
4. To analyze the admissibility of DNA technology in the court rooms of the United Kingdom and the United States of America.


¹⁴ Available at [http://www.Lincoln_Kayla_Marisa_IQP_Final.pdf](http://www.Lincoln_Kayla_Marisa_IQP_Final.pdf), viewed on 26/07/2012 at 03.38pm.

¹⁵ Available at [http://www.rand.org/content/dam/rand/pubs/technical_reports/2010/RAND_TR918.pdf](http://www.rand.org/content/dam/rand/pubs/technical_reports/2010/RAND_TR918.pdf), viewed on 23/02/2014 at 07.00 pm
5. To suggest remedial measures to effectuate the use of DNA technology in India.

1.4. HYPOTHESES
1. There is a positive co-relation between the development of DNA technology and crime prevention as well as in identification of criminals and exclusion of innocent suspects.
2. As DNA test is not violating the human rights of the accused, it may be legally recognized and practised for better investigation.
3. Indian Judiciary is rationally and systematically evaluating DNA evidence for its verdict.
4. Better co-ordination between the crime branch, the other enforcement agencies with an updated technology and the law, like the United Kingdom and the United States of America may help India with a better preventive measure.
5. Special Legislation on DNA should be enacted and proceed from the guidance of developing nations especially the United States of America and United Kingdom who were successfully using DNA technology in their legal system and amendments should be made to the existing legal provisions which dealt with DNA testing in India.

1.5. METHODOLOGY
The research is purely doctrinal conducted with reference to the existing legislations, the judicial precedents national as well as international. Legal and scientific literature has been collected from textbooks, journals, and internet sites, etc. This research work is an analytical study which lays down the general principles of DNA technology, its utility wherein the relationship of science and law is examined. The issue of admissibility of DNA evidence in the courtrooms has been critically analyzed in minute detail in this research work. Based on the nature of this research work, the researcher has adopted doctrinal, analytical, and critical methodologies.

1.6. LIMITATION AND DELIMITATION OF THE STUDY
The limitation of the study is that the researcher has collected reference material from secondary sources through textbooks, articles from the newspapers, and journals, and the reference from the court proceedings and web sources but not beyond this limitation.
The study is delimited for evaluating the role of the Supreme Court and the High Courts for admitting DNA in criminal cases in India. The researcher has analyzed the Supreme Court and High Courts judgments from the period of 1991 to 2014. In these judgments, the researcher has made an analysis in the following five types of cases:

(I) Maintenance cases,
(II) Rape and murder cases,
(III) Murder cases,
(IV) Unnatural offenses and murder case, and
(V) Assassination case.

1.7. SCHEME OF THE STUDY

CHAPTER I – INTRODUCTION

Chapter I is the introductory part of the research work and it consists of the statement of the problem, review of literature, objectives of the study, hypotheses, methodology, limitation and delimitation of the study, and scheme of the study applied herein.

CHAPTER II – DNA TECHNOLOGY AND ITS APPLICATION

Chapter II narrates the development of DNA technology and the methods which were used from 1920 to 2000. For better understanding, the researcher separates the development of DNA technology into before the advent of DNA technology and after the advent of DNA technology. It also explains the scientific structure of DNA, the value of DNA evidence, and from which sources the analysis of DNA can be conducted, and the preservatives to be used while preserving the evidentiary samples before conducting DNA analysis. Further, it explains the DNA fingerprinting as well as the laboratory methods used for conducting DNA fingerprinting. It finally focuses on the application of DNA technology in the legal field for the purpose of identification. Indeed, this chapter attempts to bring out that there is a strong connection between the science and the law.

CHAPTER III – THE RELEVANT STATUTES AND CONSTITUTIONAL LAW ON DNA IN INDIA

Chapter III focuses on the relevant statutes dealing with the DNA in India. It also discusses case laws dealing with Sections 53, and 173(8) of the Criminal Procedure Code, 1973. It mainly focuses on the constitutional validity of
provisions authenticating biological samples for conducting DNA test under Article 21 and Article 20(3) of the Indian Constitution through case law analysis. It finally focuses on steps taken by the Government of India for enacting DNA legislation in 2007 and 2012, related committee reports, and case law.

CHAPTER IV – JUDICIAL ATTITUDE TOWARDS EVIDENTIARY VALUE OF DNA IN INDIA

Chapter IV mainly focuses on the role of the judiciary for admitting DNA in criminal cases in India through case law analysis. For that, the researcher has made an analysis in the following five types of cases:

(I) Maintenance cases,
(II) Rape and murder cases,
(III) Murder cases,
(IV) Unnatural offenses and murder case, and
(V) Assassination case.

CHAPTER V – DNA TECHNOLOGY IN UNITED KINGDOM AND UNITED STATES OF AMERICA IN COMPARISON WITH INDIA

Chapter V deals with the admissibility of DNA in United Kingdom and United States of America with a view to comparing with India.

CHAPTER VI – STEPS TAKEN FOR ENACTING DNA LEGISLATION IN INDIA – 2007 & 2012

Chapter VI deals with the Human DNA Profiling Bill, 2012 and its salient features and recommendation made under the National Privacy Principles on Human DNA Profiling Bill, 2012 and related case law.

CHAPTER VII – CONCLUSION AND SUGGESTIONS

Chapter VII articulates the conclusion drawn from the research work and suggest measures to overcome the earlier position and by that way to advance the criminal justice system in India.