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# **THE IMPORTANCE OF DNA IN CRIMINAL INVESTIGATIONS**

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## **Abstract**

With the development of science and technology in the legal field, forensic science has contributed vastly to ensure that justice is administered to those who are affected. DNA Evidence has played an important role in the criminal justice system over the recent years. DNA findings have often helped to determine the culprits of several cold cases where sufficient traditional evidences were not present. Such evidences aid criminal investigations and helps to establish a link between the crime and the perpetrators. Hence, DNA evidence is crucial to protect victim's rights and solve grave crimes like murder, rape, sexual assault etc. Further, DNA evidence is also utilised to exonerate accused persons in crimes and for the identification of victims in crimes where the body is severally damaged. This article aims to understand DNA evidence, its importance in ensuring Justice and the various legal challenges involved in introducing such evidence before court. The research aims to also determine the need to develop and amend criminal legislation to include DNA evidence and the need of a DNA database to ensure immediate identification of criminals.

## **INTRODUCTION**

Previously, courts relied upon traditional forms of evidence collected from the crime scene or presented before the court. Such evidences are linked with accused persons and accordingly they are convicted, upon further investigation. In most situations this method has proven to be effective. Although, this has also led to the conviction of innocent persons, in certain cases where the alibi of the accused is against his/her favour and several criminals are even released due to lack of sufficient evidence. Hence, there is a need to acquire an efficient system to ensure that the actual offenders are punished for the crime committed by them and for the protection of the society from harm. Further, this may also help for the exoneration of innocent persons who have been wrongfully convicted for the crime.<sup>1</sup>

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<sup>1</sup> Grette Sara Titus," The Role and Importance of DNA Evidence in the Indian Criminal Justice System", Indian

Forensic Evidences play an important role in such circumstances. These evidences tend to be highly accurate and often help to identify the culprits through the evidence left by him/her. DNA or Deoxyribonucleic Acid is a unique biological blueprint present in human beings. This component is present within all cells of the human body and can be used to identify a person. Two individuals cannot have the same DNA with the exception of identical twins. In criminal investigations, DNA is collected from any cell, hair strands, blood, tissues, semen or bodily fluids unintentionally left behind by the perpetrators of the crime at the scenes of crime and they are identified through a process known as DNA profiling. With such developments, criminal investigations have recently leaned upon DNA evidences acquired from the crime scene to connect the offenders to the crime. Forensic data has even been used to solve several crimes in countries like USA and UK. However, the application of this data has raised issues on the human rights of the accused against self-incrimination and the right to privacy. This often raises conflict as to whether the evidentiary value of such DNA evidences is significant so as to hamper the basic rights provided by the constitution.<sup>2</sup>

### **Meaning and Concept of DNA Profiling**

The forensic technique called genetic DNA profiling uses the distinctive patterns in each person's DNA (deoxyribonucleic acid) to identify them. With the exception of identical twins, 99.9% of human DNA is the same, and just 0.1% of it is specific to each person, making it unique. Evolutionary mutations are to blame for these variations. DNA fingerprinting assesses human diversity at its most fundamental level by looking at the human genetic blueprint and has several benefits in criminal investigations. For instance, authorities can clear people who have been falsely accused or convicted of a crime by matching the DNA of suspects with DNA evidence gathered from the crime scene. The technology also aids in the identification of dead bodies, Disaster Victim Identification (DVI), and in resolving biological parentage disputes, agricultural modernization, the analysis of genetic illnesses, the study of genetic mutations, and the resolution of immigration challenges, among other things. This practice serves to illustrate the persuasive potential of modern scientific evidence in criminal investigations. Due to its dependability, initiatives to regulate and safeguard DNA data within the State have been initiated<sup>3</sup>.

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Journal of Forensic Medicine and Toxicology, 2023;17(4).

<sup>2</sup> Ibid

<sup>3</sup> FORENSIC DNA PROFILING: A LEGAL AND ETHICAL PERSPECTIVE IN THE INDIAN CRIMINAL JUSTICE SYSTEM, available at <https://icrep.cusat.ac.in/journal/d/64a2eac7-0737-44fc-b809-255f9dd4cd1f>, last visited on (Feb 2,2025)

Over the past roughly four decades, DNA profiling in a forensic setting has grown significantly. Alec Jeffery's single and multilocus searches for autoradiography were the first step in forensic DNA fingerprinting, which was then succeeded by fluorescence-based PCR- STRs. An important development in human identification technology recently. The most recent development is massively parallel sequencing on chips. Rapid DNA testing, genetic genealogy, and more effective methods of extraction are now necessary because of the generation of investigative findings and leads, catastrophe victim identification, and unsolved cases. Combining STR-SNP sequencing, mitochondrial DNA for difficult sample analysis and forensic genetic genealogy has expanded the possibilities for producing the information necessary for identification.<sup>4</sup>

DNA carries the genetic code of the person from whom it was extracted. It is inherited and is in charge of many personal characteristics. Every living cell in the body, with the exception of red blood cells, contains DNA, making it possible to identify any traces of blood, hair roots (but not hair or nails), or semen found at the scene of a crime by matching the material's DNA profile to that of the suspects. Despite these advantages, there are good reasons to proceed with caution. A distinctive calling card left at the site of the crime is not the same as DNA profiling. In particular, the use of DNA profiles raises concerns in three key areas: the validity of the testing process, the implications for human rights, and the interpretation of the results<sup>5</sup>.

### **DNA forensics in the Indian Legal System**

Section 53 of the 1973 Code of Criminal Procedure allows a police officer to seek the aid of a medical professional in good faith to conduct an inquiry. However, it does not allow a complainant to collect blood, sperm, or other evidence to establish criminal charges against the suspect.<sup>6</sup>

The Cr. P. C. (Amendment) Act of 2005 included two new provisions that allow the investigating official to acquire DNA samples from the bodies of the suspect and the complainant with the assistance of a medical practitioner. These clauses permit medical investigation of the rape suspect and medical assessment of the rape victim, respectively.

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<sup>4</sup> Ibid

<sup>5</sup> Supra note 3.

<sup>6</sup> Importance of DNA forensics in criminal investigation and trials, available at [https://blog.ipleaders.in/importance-of-dna-forensics-in-criminal-investigation-and-trials/#DNA\\_forensics\\_in\\_the\\_Indian\\_Legal\\_System](https://blog.ipleaders.in/importance-of-dna-forensics-in-criminal-investigation-and-trials/#DNA_forensics_in_the_Indian_Legal_System), last visited on (Feb 3, 2025).

However, the acceptability of these pieces of evidence has continued to be an issue due to different opinions of the Supreme Court and several High Courts in various rulings. Judges do not reject the scientific correctness and conclusiveness of DNA testing, but in some situations, they refuse to recognize this evidence due to statutory or constitutional prohibitions, as well as public policy considerations. There is an urgent need to re-examine such sections and laws since there is no rule in the Indian Evidence Act of 1872 or the Code of Criminal Procedure of 1973 to deal with science and technology concerns.<sup>7</sup>

There are provisions in the Indian Evidence Act 1872 that determine a child's parentage, such as Section 112, which specifies that a newborn child born to a mother within 280 days of the dissolution of marriage with a man, and the mother remaining unmarried, demonstrates that the newborn belongs to the man, unless proven otherwise, but there is no specific provision that would cover modern scientific techniques. In situations of civil disputes, DNA analysis is essential in determining the parentage of a child. This evidence is especially important in criminal trials, civil matters, and maintenance proceedings in criminal trials as per Section 125 of the Cr. P. C.<sup>8</sup>

The introduction of the DNA technology has posed serious challenge to some legal and functional rights of an individual such as "Right to privacy", "Right against Self-incrimination". And this is the most important reason why courts sometimes are reluctant in accepting the evidence based on DNA technology. Right to Privacy has been included under Right to Life and Personal liberty or Article 21 of the Indian Constitution, and Article 20(3) provides Right against Self- Incrimination which protects an accused person in criminal cases from providing evidences against himself or evidence which can make him guilty. But it has been held by the Supreme Court on several occasions that Right to Life and Personal Liberty is not an absolute Right<sup>9</sup>. In *Govind Singh v. state of Madhya Pradesh*<sup>10</sup>, Supreme Court held that a fundamental right must be subject to restriction on the basis of compelling public interest. In another case *Khark Singh v. state of Uttar Pradesh*<sup>11</sup>, Supreme Court held that Right to privacy is not a guaranteed right under our Constitution. It is clear from various decisions which

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<sup>7</sup> Ibid

<sup>8</sup> Supra note 6.

<sup>9</sup> Dr. Nirpat Patel, "The Role of DNA in Criminal Investigation – Admissibility in Indian Legal System and Future Perspectives", *International Journal of Humanities and Social Science Invention*, 2013, 2(7).

<sup>10</sup> 1975 AIR 1378

<sup>11</sup> 1963 AIR 1295

have been delivered by the Supreme Court from time to time that the Right to Life and Personal Liberty which has been guaranteed under our Indian Constitutions not an absolute one and it can be subject to some restriction. And it is on this basis that the constitutionality of the laws affecting Right to Life and Personal Liberty are upheld by the Supreme Court which includes medical examination. And it is on the basis that various courts in the country have allowed DNA technology to be used in the investigation and in producing evidence. To make sure that modern technologies can be used effectively, there is an urgent need of a specific legislation which would provide the guidelines regulating DNA testing in India.

### **Admissibility of DNA forensics in criminal trials**

The admissibility of DNA evidence in court is always dependent on its correct and efficient collection, storage, and recording, which can convince the jury that the evidence submitted is credible. There is no explicit statute in India that may offer precise directions to investigative agencies and courts, as well as the method to be followed in instances used as evidence. Furthermore, there is no explicit provision in the Indian Evidence Act of 1872 or the Code of Criminal Procedure of 1973 for dealing with science, technology, and forensic science concerns. Due to the lack of such a regulation, an investigating officer faces significant difficulties in gathering evidence that utilises current mechanisms to prove the accused individual.<sup>12</sup>

The DNA Technology (Use and Application) Regulation Bill introduced in 2019 seeks to regulate the use of DNA evidence and contains a Schedule of offences for which DNA evidence can be used. This Schedule mainly consists of offences under the Indian Penal Code, 1860, and some civil issues, like a suit for determination of paternity. The Bill also delves into the procedure to be followed for collecting DNA evidence, establishing and managing DNA Data Banks at national and regional levels, and establishing authority for supervising the functioning of DNA Data Banks and DNA labs. Further, the Bill lays down the collection of DNA without authorization, and unwarranted disclosure of DNA information as offences.<sup>13</sup>

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<sup>12</sup> Importance of DNA forensics in criminal investigation and trials, available at [https://blog.ipleaders.in/importance-of-dna-forensics-in-criminal-investigation-and-trials/#Admissibility\\_of\\_DNA\\_forensics\\_in\\_criminal\\_trials](https://blog.ipleaders.in/importance-of-dna-forensics-in-criminal-investigation-and-trials/#Admissibility_of_DNA_forensics_in_criminal_trials), last visited on ( feb 2, 2025).

<sup>13</sup> Ibid

### **DNA profiling in civil cases**

The case of Kunhiraman vs Manoj<sup>14</sup> is a landmark in the history of the Indian judiciary. In this case, the Chief Judicial Magistrate (CJM) stated the opinion of the expert of the DNA report as quoted “The evidence of the expert is admissible under sec. 45 of Indian Evidence Act. So, the ground on which the opinion is arrived at is also relevant U/S 51 of the Indian Evidence Act. PW4 is an expert in the matter of molecular biology and the evidence tendered by him is quite convincing and I have no reason why it should not be accepted. Just like the opinion, if a chemical analyst or like the opinion of a fingerprint expert, opinion of PW4, who is also an expert in the matter of cellular and molecular biology, is also acceptable”. Mr. Kunhiraman was proven to be the biological father of the child. This verdict was appealed to the Kerala High Court, which was upheld by the court<sup>15</sup>

Another paternity dispute, Kantidev vs Poshiram<sup>16</sup> case, the court clearly stated that “The result of a genuine DNA test is said to be scientifically accurate. But even that is not enough to escape from the conclusiveness of Section 112 of the Act, e.g. if a husband and wife were living together during the time of conception, but the DNA test revealed that the child was not born to the husband, the conclusiveness of law would remain un-rebuttable. This may look hard for the husband who would be compelled to bear the fatherhood of a child who is not biologically his own. But even in such case, the law leans in favour of the innocent child from being bastardized if his mother and her spouse were living together during the time of conception. Hence the question regarding the degree of proof of non-access for rebutting the conclusiveness must be answered in the light of what is meant by access or non-access as delineated above” (Verma and Goswami 2014; Law Commission of India, Department of legal affairs, Govt. of India 2017).<sup>17</sup>

Another landmark judgement was given in the N.D. Tiwari case, where a young man claimed to be the son of N.D. Tiwari and sought the court’s help prove the paternity. The politician was asked to undergo DNA testing by order of the court, but he rejected stating that it would be in violation of his privacy and would also cause public humiliation. The Supreme Court held that the results will be not be revealed to the public and will be only used to show the paternity of

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<sup>14</sup> 1991, 3, Cri 860 (Ker) 2.

<sup>15</sup> Impact of DNA evidence in criminal justice system: Indian legislative perspectives, available at <https://ejfs.springeropen.com/articles/10.1186/s41935-022-00309-y>, last visited on ( Feb 3 , 2025)

<sup>16</sup> AIR 2001 SUPREME COURT 2226

<sup>17</sup> Supra note 15.

the young man as he has the right to obtain justice and ordered the test to be conducted. The result eventually concluded that the man was in fact the son of N.D. Tiwari.<sup>18</sup>

### **Case laws**

Gautam Kundu vs. State of West Bengal (1993)<sup>19</sup>; The case amplifies the perfect understanding of the extent of Section 112 of the Indian Evidence Act, 1872, and Article 20(3) of the Indian Constitution also connects with this case, as under this no individual can be compelled or forced to provide their body samples to carry on the DNA process as it is against the fundamental principle.<sup>20</sup>

Rajli Rajjo vs. Kapoor Singh and Ors.<sup>21</sup> (2013): This case was decided by the Punjab and Haryana High Court, in which a criminal investigation was going on, and evidence had been collected from the crime scene. The DNA samples were helpful as a blueprint to prove the innocence of the accused.

Javed Rehman Shaikh vs. State of Maharashtra <sup>22</sup>(2021): This case is a perfect example to clarify the relevance of DNA testing methodology. In this case, samples of nail clippings as well as blood samples were collected to match the samples, and the offender was caught with the help of the same.<sup>23</sup>

### **Conclusion**

DNA evidence or proofs generated out of modern techniques provide useful insights in serving fair justice to citizens and also contribute towards criminal examinations. Evidence acts as a blueprint in every investigation to prove the right person guilty of committing an offence and provide justice to the victim of the case as well. DNA evidence revolves around the criminal investigations to come to the exact point. With the innovation of new technology, wrongdoers get caught easily, and the technology also provides accurate results so that fair outcomes are generated.

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<sup>18</sup> Grette Sara Titus. The Role and Importance of DNA Evidence in the Indian Criminal Justice System. Indian Journal of Forensic Medicine and Toxicology 2023;17(4).

<sup>19</sup> 1993 AIR 2295,

<sup>20</sup> Supra note 15

<sup>21</sup> CR No. 5090 of 2012

<sup>22</sup> Cr No. 8482/2023

<sup>23</sup> Supra note 15