



The Use Of Dna Evidence In Overturning Wrongful Conviction

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1. **ABSTRACT**

The rise in the overall crime rate is quite alarming, with numerous First Information Reports (FIRs) being filed each day. In this scenario, it falls to the accused to prove their innocence by presenting evidence that backs their claims. Witness statements play a vital role in legal processes, while modern scientific techniques improve the gathering of essential information regarding the crimes committed.

The introduction of DNA evidence has profoundly influenced forensic science and criminal investigations. This type of evidence may include samples such as blood, saliva, skin cells, semen, and hair. A DNA report can have an important impact on a person's conviction by proving innocence and offering a strong defense for the accused.

When evidence is insufficient, a person risks being unfairly convicted. DNA evidence plays an important role in correcting such unjust convictions because it is a valuable resource for establishing innocence and identifying the genuine offenders. While there are specific challenges and limitations associated with DNA evidence, its benefits are evident, solidifying its role as an essential instrument in the pursuit of justice.

Keywords: *DNA, Evidence, Forensic Science.*

2. INTRODUCTION

“Let Hundred Guilty Be Acquitted But One Innocent Should Not Be Convicted”

The most harmful aspect of the criminal justice system is the false conviction of people for crimes they did not commit. Such unjust verdicts can have severe repercussions for both the victims and their families. Evidence gathered from the scene of the crime is brought to court, where it is connected to the accused, often leading to a guilty verdict. This approach has been successful in many cases, yet it has also resulted in the conviction of innocent individuals; in some instances, the alibi of the accused was shown to be false, and certain offenders have been freed due to a lack of sufficient evidence. Consequently, it is crucial to develop an effective system that ensures true perpetrators are held responsible for their actions while safeguarding society from harm.

Many false convictions are the result of sophisticated investigations incorporating a variety of circumstances, complex juror deliberations, and errors caused by evolving regulations and practices. As a result, the role of forensic science in each case often requires subjective interpretation. Wrongful convictions have a long-term harmful impact on witnesses, investigators, attorneys, judges, and other criminal justice professionals. Individuals who have been falsely sentenced can find satisfaction in their ultimate exoneration, and the evidence that emerges can be exceedingly specific, aiding in the identification of the true criminals.

3. DNA EVIDENCE

The long, double-stranded molecule known as deoxyribonucleic acid, or DNA, forms a double helix or twisted rope ladder. DNA is a particular type of blueprint that provides information for genetic research. DNA can be retrieved from any bodily fluid that is removed without any intended use, such as tissues, blood, semen, hair, cigarette butts, blood, razor clippings, or saliva. To guarantee its correctness in criminal investigations, the remaining evidence will be tested and examined. The primary function of a DNA profile is to identify a person and his or her biological family, including parents, siblings, and so forth. DNA profiling has also been used successfully to identify skeletal remains.

DNA evidence facilitates the identification and prosecution of perpetrators while contributing to broader dialogues on justice and human rights in the Indian court system by scrutinizing its legal, procedural, and ethical dimensions. More than ever, DNA evidence is being utilized in criminal cases throughout the nation to exonerate those who have been falsely charged or convicted as well as to condemn the guilty. This technology is used to improve conventional forensic methods in a variety of criminal instances, such as homicide and sexual assault. DNA profiling has transformed India's criminal justice system by giving a strong tool for identifying perpetrators and freeing innocent people.

Since there used to be no method to identify the true offenders, DNA is crucial. However, since this technology was developed, infamous offenders have been more easily recognized and innocent people have been given justice. The accurate identification of the culprits is aided by forensic evidence, such as DNA, and the props they left behind.

DNA profiling was used for the first time. Two women were raped and then killed in 1983 and 1986. The creator of the DNA profiling method was asked to perform a DNA profile analysis on the samples extracted from the victims' bodies since it was assumed that the two murders were carried out similarly. Analysis of semen samples extracted from the victims' bodies revealed similarities, pointing to a single person as the perpetrator of both murders. The results showed that the main suspect, Richard Buckland, was not the murderer in this case. He was eventually found not guilty, becoming the first person to be released based on DNA evidence.

4. EVOLUTION DNA EVIDENCE IN JUDICIAL PROCESS

Even when dealing with medical and technological issues, the majority of laws are implicit. Thus, only courts can accept or reject DNA tests. This usually leads to uncertainty and disarray when enforcing justice. As a result, acceptance in court demands the legality of the DNA collection and testing process, as well as the judges' belief in the test's validity. Despite the clear benefits of DNA profiling technology, Supreme Court and High Court justices disagree on whether DNA evidence should be allowed in court due to constitutional or legislative limits.

Properly collected DNA can be matched against known samples to help identify a suspect near the crime scene. In cases where a suspect isn't known, a DNA profile obtained from the evidence can be entered into the authorities' system, aiding in linking together serial crimes or identifying a suspect elsewhere. To pinpoint the exact source of the DNA, it may also be necessary to gather and analyze elimination samples, ensuring that DNA can be effectively used as evidence.

Anyone allowed to access the crime scene and possibly left biological material can be asked to give an elimination sample. If someone had consensual sex with the victim within 72 hours before the incident, they can be requested to provide a sample. This step helps identify all DNA found on the victim or at the scene. Comparing these DNA profiles with the evidence helps investigators understand what the DNA reveals.

Evidence law is projected to undergo significant changes as new technology become more prevalent. Judges may find difficulty if they don't understand the new evidentiary standards.

The Indian government is rapidly analyzing the accuracy, reliability, and validity of DNA profiling. This is in response to a police officer's request for a medical examination of the accused. A physician can analyze biological samples, such as blood, semen, and saliva, from the accused person or persons.

5. LEGAL PROVISION IN DEALING WITH DNA EVIDENCE

Our judicial system does not contain a specific legislation or clause addressing DNA evidence. Nonetheless, certain sections are designated for handling and dealing with DNA evidence. DNA has proven essential to the Indian criminal justice system since it offers undeniable scientific validation in a range of criminal investigations, including cases of sexual assault, child abuse, and murder. By outlining

the approach and prospective applications, they provide an indirect response to this type of evidence. They serve as a basis for judging the caliber, applicability, and admissibility of evidence in criminal prosecutions.

Section 39 (1) of BSA, 2023

Only in situations when there has been disagreement over elements like age, date of death, DNA analysis, handwriting, fingerprints, etc. have scientific expert testimony been offered to Indian courts. Nonetheless, the court may consider evidence about genetic abnormalities that lead to criminal behavior under this clause. Since they are experts who have dedicated time to the particular subject of study and have the skills required to form an opinion on a fact in their field, of competence, the experts' testimony is recognized in court. In the recent case the Supreme Court prioritized DNA testing as per Section 39(1), rather than relying on the legal presumption outlined in the Act.

Opinion of expert is considered to be legitimate and admissible. The evidence remains significant even if oral testimony contradicts an expert's view. The evidence becomes relevant if it challenges an expert's opinion. The capacity of an expert to create a trustworthy view determines how important their opinion is. However, expert testimony is still subject to the court's judgment about its reliability. It has long been believed that expert opinion has corroborating value. According to the court, an expert's role is to depose rather than make a decision. The expert's sole responsibility is to provide the data with the required standards so that the court may reach a decision on their own.

Section 51 and 52 of BNSS, 2023

The police have the authority to ask a doctor to examine the suspect, including taking DNA samples. Along with other kinds of medical testing, the DNA profiling approach is especially mentioned in the section. "DNA profile" refers to a document made using DNA samples that are accessible to forensic specialists.

It is easy to create and maintain suspect DNA profiles since it is simple to match newly collected DNA samples to previously collected profiles. An increasingly important technique for linking suspects to specific crimes is DNA sample matching. It casts a duty on the Registered Medical Practitioner examining an accused of offence of rape to prepare a report of his DNA profiling without delay. This section clearly specifies and gives instruction as to in which manner medical examination should be conducted of a person who is accused of rape. It is mandatory for the officials to conduct the examination in that manner.

Section 184 of BNSS, 2023

The provision authorizes the collection of biological samples for DNA analysis. This section addresses the Registered Medical Professional's examination of a rape victim in order to promptly generate a report on her DNA profile. With the cooperation of the rape victim, a medical professional may obtain DNA

evidence from her for use as proof in court. During the victim's medical checkup, swabs or body fluids that can be utilized for DNA analysis are collected. This is very essential to be conducted as it can help to collect evidence which would have been left on the body of the victim. While taking the samples they collect all the possible marks or scars left which can later be examined and compare with that of the accused person. This simplifies the legal process by making it simpler to locate and compare the accused.

6. CONSTITUTION AND IT VIEW ON DNA EVIDENCE

The articles enshrine the fundamental rights of Indian citizens, sparking debate as they uphold the rights of individuals regardless of innocence or guilt. There are two primary articles in the Indian Constitution that pertain to the issues arising from DNA evidence. These articles are as follows:

Article 20(3) of the Indian Constitution

Article 20(3) of the Right Against Self-Incrimination ensures that individuals facing allegations cannot be compelled to testify against themselves, thereby safeguarding against the use of involuntary confessions in court. The judicial system, however, has made it clear that the court can still authorize DNA testing when it is seen necessary, even if the defendant has the right to avoid self-incrimination. The Court determined that supplying samples or undergoing medical testing does not constitute self-incrimination. It further emphasized how DNA testing supports Article 20(3) safeguards and can be crucial in establishing a connection between accused individuals to criminal acts.

Article 21 of the Indian Constitution

Every Indian citizen, including those who have committed crimes, is guaranteed to privacy under Article 21 of the Constitution. This article highlights the fact that people cannot be compelled to submit samples for the examination of DNA. The Supreme Court clarified that the protections of Article 21 may be revoked under a number of conditions, especially when a legislation or procedure is in effect deemed just, reasonable, and established by law. Furthermore, this right has been shown to be qualified and subject to superseding under specific circumstances.

It is impossible to reject these two publications as unethical evidence because they are consistent with forensic examination techniques. The samples must adhere to legal and ethical requirements in order to prove their evidential value. Discussions are sparked by the fundamental rights that Indian people have, which state that everyone is entitled to these protections regardless of their criminal history. Consequently, everyone in India, especially those with criminal past, have the right to privacy. This concept states that no one may be coerced to provide DNA analysis samples.

7. TYPES OF DNA EVIDENCE

7.1 Blood DNA : Blood is a valuable form of evidence since it is a rich source of DNA. The Court ruled that the application for a blood test could not be allowed since it did not present a reason for using the test. It was also decided that no one could be forced to provide a blood sample for examination, and no one could be penalized for doing so. Forensic specialists are frequently called upon to inspect crime scenes, such as homicide, hit-and-run, assault, rape, and burglaries, and gather evidence from clothing, the floor, or any other area where bloodstains are visible in order to determine the genetic variation at the molecular level.

7.2 Fingerprint DNA : Two molecular biology tools are required to prepare a person's DNA fingerprint. As with all DNA, the first is a DNA probe, which is simply a short bit of single-stranded DNA with a specific letter-base sequence. A probe is one essential component of DNA structure . It attaches itself to a DNA strand with letter sequences that complement one other. Each individual's band pattern is as unique as their finger whorls. The suspect's sample and the one taken from the crime scene are then compared . Anything the person touches in the crime scene will leave his identity or mark on the said thing so the presence of the person will be noted.

7.3 Hair DNA : Hair is an essential component of forensic analysis and is one of the most commonly found biological evidence items at a crime scene. Hairs, especially non-follicular hairs, are often found in crime scenes as a result of either natural or forced shedding. Unfortunately, forensic examination is difficult since the genetic material in hairs is often extensively degraded. Forensic trials and investigations have thus not fully capitalized on the significance of hair. Amazing advancements in hair forensic analysis have been made possible by recent advances in molecular biology, and in a few of cases, these advancements have provided crucial insights. By examining recent developments in hair DNA and protein analysis, this paper attempts to provide a thorough response to enhance forensic hair analysis.

7.4 Semen DNA : Semen DNA is an essential piece of evidence in criminal investigations, especially in cases of sexual assault, because it can be used to identify a suspect through DNA profiling, which links a potential perpetrator to the crime scene and establishes that sexual contact took place . Even if the semen contains very few sperm cells, the presence of male epithelial cells can still produce a DNA profile.

8. COLLECTION AND ANALYSIS OF DNA EVIDENCE

8.1 Crime scene investigation : DNA evidence is methodically collected at the crime scene using advanced techniques and equipment. Forensic experts are dispatched to the scene to examine the area collect pertinent evidence, and document everything in the spot panchnama.

8.2 DNA extraction : DNA was obtained from the collected evidence through various techniques. This process is performed during a medical examination of the individual.

8.3 PCR (Polymerase Chain Reaction) : PCR plays a crucial role in amplifying the amount of DNA that can be analyzed. The landscape of DNA testing saw remarkable progress when scientists discovered a method to replicate DNA artificially, imitating the natural processes that occur in living organisms. By utilizing an enzyme known as polymerase, the polymerase chain reaction (PCR) technique facilitates the duplication of DNA segments inside a test tube. This procedure can be repeated numerous times, allowing even a little DNA sample to multiply into billions of copies in a couple of hours.

8.4 Comparison to known DNA profiles : The DNA profile is compared to samples from the suspect or profiles stored in DNA databases.

9. IMPACT OF DNA EVIDENCE

- **Enhancing the precision and dependability of research:**

The impact of DNA evidence on improving the accuracy and reliability of criminal investigations is profound. Widely acknowledged as the leading tool in forensic science, DNA profiling offers an exceptional level of precision. This technology empowers detectives to draw solid connections between suspects and crime scenes, ultimately enhancing the integrity of the investigation process. Most experts agree that it's the most effective and trustworthy method available, allowing investigators to establish definitive links with unmatched accuracy.

- **Promoting equity and preventing injustice:**

The expanding use of DNA evidence has significantly improved the fairness and integrity of court proceedings in the criminal justice system. This type of evidence has revolutionized judicial decision-making and legal strategy and court presentations by encouraging a more objective, fact-based approach. DNA evidence has been particularly useful in situations when eyewitness testimony or circumstantial evidence could be the prosecution's major DNA testing improves justice is served by confirming or refuting such evidence and assisting in the prevention of wrongful convictions.

10. USE OF DNA EVIDENCE IN INDIAN JUDICIAL PROCEEDING

- Analyze the connections between the criminal and the victim, the weapon and vehicle used, and the crime scene data, including the routes taken, using body parts as evidence.
- Utilize bodily components, such as hair strands, to identify the offender or the victim.
- In cases of sexual assault, identification of the assailant can be achieved through vaginal swabs, semen samples, or stains.
- Look for indicators like saliva, bite marks, cigarette ends, or cups that might carry saliva to help identify the offender.
- Identification can also be achieved by analyzing feces or urine, as well as distinguishing various body components on mutilated corpses.
- In gang rape investigations, efforts should focus on identifying all individuals involved.
- During incidents of robbery or burglary, offenders often leave behind bodily fluids such as blood, semen, hair, or saliva, which can be crucial for identification.
- Understanding the patterns and techniques followed by serial offenders can provide valuable insights into their crimes, such as rapes and murder.

11. CHALLENGES AND LIMITATION OF DNA EVIDENCE

● **Issues with Admissibility and Reliability**

Recent decisions from the Supreme Court have sparked important discussions about the reliability and acceptability of DNA evidence in criminal cases. The Court has scrutinized the procedures involved in collecting, processing, and interpreting DNA, raising concerns about contamination risks and inadequate procedural safeguards. A particularly difficult issue is the frequent elimination of the random occurrence ratio, or "random match probability" (RMP), from DNA studies. This statistical measure is critical for determining the significance of a DNA match.

● **Lack of a Strong Legal Framework**

India is currently facing severe challenges in governing the use of DNA evidence, owing to a lack of a clear legislative framework for DNA technology in the criminal justice system. The existing legal framework does not effectively address the complexities and standards required for the acceptance of DNA evidence. The lack of clear criteria has resulted in inconsistent applications and interpretations of DNA evidence in courts, compromising its reliability and usefulness in criminal investigations and prosecutions.

- **Insufficient Knowledge and Guidance**

To uphold the integrity of our criminal justice system, it's essential to promote awareness and provide comprehensive training for legal experts, law enforcement, and the judiciary on effectively understanding and interpreting DNA evidence. A lack of understanding and competence can lead to the misinterpretation or misuse of DNA evidence, perhaps resulting in false convictions or the failure to recognize key evidence. This includes understanding the limitations of DNA and how to collect, preserve, and present DNA samples correctly.

12. SUGGESTION AND RECOMMENDATION

- **Increasing and expanding the knowledge :**

Provide money to help forensic experts and law enforcement officers learn more about DNA analysis and how it's used in criminal investigations. To make sure that DNA evidence is accurately collected, processed, and evaluated, provide professional workshops, training sessions, and opportunities for continued education. To create a multidisciplinary approach to the use of DNA evidence, promote cooperation between law enforcement, forensic scientists, and legal experts.

- **Improving the Forensic Infrastructure :**

India's network of forensic labs should be expanded and improved in order to efficiently manage the rising demand for DNA analysis. Make sure labs have enough supplies to manage the growing number of patients, the newest equipment, and highly skilled staff. Encourage the use of cutting-edge DNA profiling tools like Next-Generation Sequencing to improve the accuracy and precision of DNA analysis.

13. CASE LAW

➤ **Rahul v. State of Delhi (2022)**

The validity of DNA evidence was seriously questioned by the Indian Supreme Court. The majority of these concerns arose from severe ambiguities about the sample collection and sealing processes. The DNA evidence at the center of the case was questioned because it may have been handled improperly and improperly during sample collection and preservation, even if it showed a match. The Court underlined how important it is to uphold a stringent chain of custody and make sure that samples are gathered, sealed, and moved in a manner that totally eliminates any possibility of contamination or manipulation. The court determined that the DNA evidence could not be considered completely credible due to the questionable integrity of the sample processing procedure. Consequently, the Court pronounced the

accused not guilty, despite the DNA match. The Court underlined that upholding the values of justice and ensuring a fair trial depend heavily on the validity of forensic evidence.

➤ **Mukesh and Another v. State (NCT of Delhi) and Others (2017)**

The reliability of DNA evidence and emphasized how important it is to use it carefully in court. DNA reports should be regarded as extremely important and reliable, the Court said, adding that unless there are strong grounds to doubt their validity, such evidence should be regarded as conclusive. In particular, the Court ruled that it must be proven beyond a reasonable doubt that the report is faulty due to a lack of quality control or assurance during the testing process in order to reject a DNA result. This announcement promotes the use of scientifically sound methods to maintain equity in the administration of justice and represents a significant step forward in bolstering the probative value of DNA in the judicial system.

14. CONCLUSION

The incorporation of DNA evidence into the criminal justice system has resulted in dramatic changes due to its consistency as a stable chemical identifier that provides incontrovertible proof required for accurate convictions. According to research, greater sample numbers considerably increase the likelihood of good outcomes. While the conditions under which DNA is maintained are necessary for analysis, parameters such as sample size, stain type and sample age are not always as essential.

This shift in investigation methodology has improved research efficiency and dependability, particularly in the face of practical limits like evidence admissibility. Addressing these difficulties will involve deliberate training and infrastructural expenditures. Future advancements in DNA technology could lead to quicker processing times and larger databases, but it's important that these developments are monitored closely to prevent privacy violations and misuse.

In India, the application of DNA evidence has notably altered criminal investigations. To ensure its effective use, a balanced strategy is essential—one that not only upholds justice and protects individual rights but also embraces innovative technologies in a responsible manner.

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