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LEGAL IMPLICATIONS OF DNA EVIDENCE IN CRIMINAL INVESTIGATIONS WITH REGARDS TO THE RIGHT TO PRIVACY

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ABSTRACT

The role of forensic evidence in criminal investigations is very crucial. They are highly accurate and often assist in identifying criminals based on the evidence they leave behind. Our bodies contain a unique biological blueprint known as DNA, also known as Deoxyribonucleic acid. A person's identity can be determined by this component, which is present in all cells in their body. Unless two individuals are identical twins, their DNA cannot be the same. DNA profiles are used to identify perpetrators of crime whose cells, hair strands, blood, tissues, semen, or body fluids have been unintentionally left behind at the scene of crime. As a result, issues relating to the right to privacy and the right against self-incrimination have arisen from the application of this data. Such DNA evidence often raises the question of whether it is significant enough to impair the basic rights provided by the Constitution due to its evidentiary value. Since the last few years, DNA evidence has increasingly been used in Indian criminal investigations to identify suspects and exonerate innocent people. The scientific advancement is however concerned with the right to privacy under Article 21 of the Indian Constitution. When DNA data is collected, stored, and analyzed, the sensitive personal information is collected, stored, and analyzed, which can compromise privacy. Although DNA evidence can greatly aid in the pursuit of justice, it must be handled with strict safeguards to ensure constitutional protection. It is important for privacy protections to be strengthened in this context by establishing consent and oversight mechanisms. When the needs of law enforcement and the fundamental right to privacy are balanced, DNA evidence can serve justice without infringing the individual freedoms.

Keywords: DNA, Privacy, Evidence and Criminal Investigation.

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I. INTRODUCTION

As science and technology have progressed, privacy concerns, rights to self-incrimination, and permissible use remain unresolved. It was the discovery of DNA that marked one of humanity's greatest milestones. In the last decade, DNA technology has been developed in a number of fast-growing countries, including Argentina, Canada, the United States, China, Great Britain and Scotland. DNA profiling is used in these countries to verify identities during criminal trials or after disasters. A DNA test has been used in criminal investigations since before the Criminal Code was amended³. DNA testing could be requested by the prosecution for full proof of a criminal case. Sections 51, 52, and 176 of the Bharatiya Nagarik Suraksha Sanhita, 2023 permit the collection of a DNA sample from an accused and the examination of that accused⁴. The Indian criminal procedure and evidence laws allow DNA samples to be collected, but they do not address some peculiar questions, including how this test will be conducted, what standards the testing agency will adhere to, and how the data and property will be managed, since DNA profiling is highly vulnerable to privacy concerns. As part of legislation addressing these questions, the government has created a draft bill of DNA profiling since 2003⁵. In its recent report, the law commission of India outlined guidelines for regulating DNA technology after several changes have been made to the draft. The profiling of DNA will improve the efficiency of justice administration. The importance of addressing privacy issues as well as human rights violations cannot be overstated. DNA fingerprinting, DNA testing, and DNA typing are methods of forensic identification based on DNA characteristics. DNA profiling replaced previous fingerprinting methods that can be easy to obfuscate and very rarely leave a trace⁶.

An individual's genetic information is stored in a small molecule called a genome. DNA stands for deoxyribonucleic acid⁷. The DNA molecule is typically described as a two-helix structure composed of double chains of nucleotides. In eukaryotic organisms and prokaryotic organisms, it is commonly found in the nucleus. In this type of lab test, each human being is assessed for characteristics such as hair texture, eye color, finger impression, and a variety of other traits. An individual's DNA can be used to determine how they are growing and developing, if any

³ Smith, Marc & Gregor Frank Urbas. "Regulating new forms of forensic DNA profiling under Australian legislation: familial matching and DNA phenotyping." 44.1, Australian Journal of Forensic Sciences:63-81(2012).

⁴ THE BHARATIYA NAGARIK SURAKSHA SANHITA, 2023 ACT NO.46 OF2023

⁵ Srivastava, Ankit, etal. "Impact of DNA evidence in criminal justice system: Indian legislative perspectives.", 12.1, Egyptian Journal of Forensic Sciences: 51 (2022).

⁶ Preston & Corey. "Faulty Foundations: How the False Analogy to Routine Fingerprinting Undermines the Argument for Arrestee DNA Sampling." 19 Wm. & Mary Bill Rts. J: 475 (2010).

⁷ Panda, Darshan,etal. "DNA as a digital informations to rage device: hope or hype?."3 Biotech8:1-9(2018).

Stanger, Ben. From One Cell: A Journey Into Life's Origins and the Future of Medicine. W W Norton & Company, 2023.

viruses are present, and whether they are pregnant. The first DNA was identified in the late 1860s by Swiss chemist Friedrich Miescher⁶. A later recognition of its universality opened up new avenues for research and development. In 1985, forensics used it to resolve an immigration dispute in the UK. Criminal justice has been revolutionized by DNA technology since the Discovery of DNA fingerprinting.

Among the powerful and controversial tools that science has provided for the analysis of forensic evidence, is one of the powerful and controversial tools that science has provided for the analysis of forensic evidence. An analysis of DNA is also called DNA typing or DNA profiling, and involves the comparison of samples of DNA found in physical evidence with samples of DNA taken from specific individuals⁸. The use of DNA analysis in criminal trials has become commonplace. Civil litigation also uses it, especially when determining paternity.

(A) Research Objectives

Indian criminal investigations have increasingly relied on DNA evidence over the past few years, helping to identify suspects and exonerate innocent people. However, Article 21 of the Indian Constitution, which protects an individual's right to privacy, is concerned by this scientific advance. Using DNA data involves collecting, storing, and analyzing sensitive personal information, which can threaten privacy if misused. For constitutional protection, DNA evidence must be handled with strict safeguards, even though it can greatly aid in the pursuit of justice. Ensure consent and oversight mechanisms are in place in this context in order to strengthen privacy protections. DNA evidence may be used to serve justice without infringing on individual freedoms if the needs of law enforcement are balanced with the fundamental right to privacy.

II. ADMISSIBILITY OF DNA EVIDENCE IN CRIMINAL INVESTIGATION

Life is based on DNA molecules, which contain information. In criminal investigations, DNA plays an important role since it can be used to prove any point accurately and reliably⁹. Technology plays a significant role in shaping the precise and actual picture of a crime when it comes to criminal investigations and providing citizens with fair and equal justice. An easy way to examine sexual offences is by matching the DNA of the victim and the semen. It is also

⁸ Bukyya, JayaLakshmi, et al. "DNA profiling in forensic science: a review." *8.04 Global medical genetics*: 135-143 (2021).

⁹ Alketbi & Salem Khalifa. "The role of DNA in forensic science: A comprehensive review." *9.02 International Journal of Science and Research Archive*: 814-829 (2023).

possible to deliver fair justice by delivering reliable outcomes. Paternity and maternity can also be determined by taking a blood sample or a hair sample. Through the introduction of forensic science and DNA, accurate evidence could be identified and the offender could be punished more effectively¹⁰.

The use of DNA evidence for identifying criminals has proven useful when conventional methods are ineffective. When investigating rapes and murders, investigators face numerous challenges. There is a great deal of importance to the scientific examination of the victim and accused/culprit, especially the DNA test¹¹. The role DNA plays in correlating evidence, victims, and perpetrators is crucial. A series of legal reforms and amendments have been enacted as a result of DNA evidence being used in several rape and violent murder cases in India. Other than these incidents, DNA profiling of disintegrated body parts has also been used to identify suspects in the murders of Shri Rajiv Gandhi and Mr. Beant Singh (former chief minister of Punjab state, India). As in the case of Rajiv Gandhi, DNA tests helped identify the perpetrator. Herena Bora's skeletal remains are also used to identify her through DNA profiling in a very high-profile case¹². For example, DNA profiling has proven very effective in identifying terrorist victims, where conventional methods have been ineffective.

III. INDIAN LAW SON DNA

A court must be satisfied that DNA evidence can be gathered, preserved, and documented in a reliable manner before DNA evidence can be admitted to evidence. It is not possible for Indian law to provide specific guidelines, regarding DNA evidence cases, to investigating agencies or courts. Moreover, forensic science and science policies are specifically addressed in Bhartiya Nagrik Suraksha Sanhita, 2023¹³. It is reasonable for an officer to request an examination of a person arrested if the examination may reveal evidence of the offence, pursuant to Section 51. By A medical practitioner will use modern, scientific techniques to examine the patient, including DNA profiling and other tests that are determined by the patient's physician in a particular case, including blood, blood stains, semen, swabs when there has been a sexual

¹⁰ Taupin & Jane Moira. Introduction to forensic DNA evidence for criminal justice professionals. CRC Press, 2013.

¹¹ Srivastava, Ankit, et al. "Impact of DNA evidence in criminal justice system: Indian legislative perspectives." 12.1 Egyptian Journal of Forensic Sciences: 51(2022).

¹² Kadu, & Sandeep Sitaram. "DNA Finger-Printing: Current Scenario and Future." *Biological Anthropology-Applications and Case Studies*. Intech Open, 2021.

¹³ Ibid.

offence, sputum and sweat, hair samples, and nail clips¹⁴.

- A. Specifically, Section 52 covers rapes and attempted rapes. A registered medical practitioner must examine the arrested individual in an official hospital or government clinic. An examination must also include a description of the DNA profile material that was taken from the accused. Medical practitioner's reports must be submitted to the Magistrate by the investigating officer.
- B. If a crime punishable by seven years or more is reported, the police officer in charge is required to send a forensic expert to the crime scene within a specified time frame set by the State Government to collect forensic evidence¹⁵, as well as record the process on an electronic device or a mobile phone. The use of forensic experts and videography is common in serious offences. A detailed description of the forensic evidence collected is not provided, however.

It is still unclear whether these evidences are admissible since the Supreme Court and various High Courts have issued conflicting opinions. Science-based DNA testing is accurate and conclusive, but judges sometimes refuse to admit this evidence because of legal or constitutional prohibitions, and sometimes because of public policy concerns¹⁶. Despite this, the original text of The Bharatiya Sakshya Adhiniyam does not specifically mention DNA evidence since DNA technology was not available at the time. Some provisions, primarily those related to expert testimony, allow DNA evidence to be admissible, however.

IV. LIMITATIONS OF DNA EVIDENCE

Every concept has its advantages and disadvantages, and DNA is no exception. While DNA plays an important role when proving the commission of an offence, there are also limitations to its use, as explained below¹⁷:

- (i) Forensic searches take too much time (but not always). As a consequence, the tests may be contaminated, which can lead to false results, since the samples may have been left

¹⁴ Dawnay, Nick, & Kayleigh Sheppard. "From crime scene to courtroom: A review of the current bio-analytical evidence work flows used in rape and sexual assault investigations in the United Kingdom."63. 2 *Science & Justice*: 206-228 (2023).

¹⁵ Murphy & Erin."The Mismatch Between Twenty-First-Century Forensic Evidence and Our Antiquated Criminal Justice System."87 *S. Cal. L. Rev.*: 633 (2013).

¹⁶ Roth & Andrea."Defying DNA: Rethinking the Role of the Jury in an Age of Scientific Proof of Innocence."93 *BULRev.*: 1643(2013).

¹⁷ Resnik & David B. *Owning the genome : a moral analysis of DNA patenting*. State University of New York Press, 2012.

behind unintentionally and are uncertain if they were correct or not¹⁸.

- (ii) An offender's intentions cannot be justified by DNA testing on a sample he left behind without realizing that he may be held accountable if the results are returned negative¹⁹. This is another limitation of DNA evidence. For a crime to be proved, DNA evidence is required to prove mens rea, the crucial element of the crime.
- (iii) DNA samples that fail to provide reliable results often yield a number of suspects²⁰. In the absence of a complete investigation, DNA samples cannot be used to draw any conclusions.

V. THE IMPACT OF DNA EVIDENCE ON THE RIGHT TO PRIVACY

The Indian Constitution identifies potential pitfalls when DNA or forensic evidence is used to prove a crime. Indian citizens are provided with fundamental rights that are controversial because they acknowledge their rights regardless of their innocence or criminality. Article 21 of the Constitution of India guarantees the right to privacy to all citizens, including offenders. Samples provided for DNA analysis cannot be forced upon a person. According to "*The Universal Declaration of Human Rights (UDHR), 1948*", privacy is an integral part of human rights. According to UDHR Article 12, one's privacy, family, home, correspondences, etc.²¹, shall be protected from arbitrary interference. "*The European Convention for the Protection of Human Rights and Fundamental Freedoms*" asserts privacy as a right in its article on the right to privacy²². A specific reference to privacy is made in Article 8 of the ECHR. There is a considerable body of jurisprudence elaborating privacy as a human right, in addition to these provisions of "European Courts of Human Rights and the United Nations Human Rights Committee". A fundamental right of privacy has also been recognized by the Supreme Court in the past. A recent judgment by the constitution bench of the apex court has given a new dimension to the right to privacy: "**JUSTICE K S PUTTASWAMY (RETD.) AND ANR V Union of India and Ors**"²³, the Supreme Court unanimously ruled that Article 21 of the

¹⁸ Szkuta, Bianca, et al. "DNA transfer by examination tools—a risk for forensic casework?." *16 Forensic Science International: Genetics*: 246-254 (2015).

¹⁹ Patel & Anip. "The Constitutionality of DNA Sampling of Arrestees." *13 Pitt. J. Tech. L. & Pol'y* (2012)

²⁰ Stiffelman & Bess. "No longer the gold standard: probabilistic genotyping is changing the nature of DNA evidence in criminal trials." *24 Berkeley J. Crim. L.*: 110(2019).

²¹ Şener & Mustafa Burak. "A review of the meaning and importance of the Universal Declaration of Human Rights." *7.3 Uluslararası Politik Araştırmalar Dergisi*: 15-25 (2021).

²² Brems & Eva. "Conflicting human rights: an exploration in the context of the right to a fair trial in the European Convention for the protection of human rights and fundamental freedoms." *27.1 Human Rights Quarterly*: 294-326 (2005).

²³ Justice K.S. Puttaswamy (Retd) vs Union Of India, AIR 2018 SC (SUPP)1841(India)

Constitution guarantees the right to privacy to each person²⁴. Part III also recognizes and guarantees various forms of freedom and dignity, including privacy, in various ways. As a result, privacy has been elevated to the same place as these other rights.

DNA sampling, which is largely used in crime detection and in identifying victims after natural disasters, is prone to violating individuals' privacy²⁵. As a result, there will be a presumption that the accused was present at the crime scene if the suspect's DNA is found there. An initial sample is taken from a light scrape on the cheek of the targeted person if he or she is available. For those who are not available, we use indirect methods, such as hair, sputum, blood, and fallen strands of hair. However, developing infrastructure, training human force, and impeccable brevity and precision are required in order for the technique to be considered appropriate for the purpose. There will be many privacy concerns when the DNA PROFILING BILL comes into force, but likely offshoots will include:

As far as identification of individuals is concerned, there is no iota of doubt as to the legitimacy of this DNA profiling technique²⁶. The DNA profiling technique cannot be considered as an exception to the rule since no system can be considered perfect. DNA PROFILING will also yield best results under ideal conditions, as with any other scientific process. As you can see from the following illustration, this technique has an obvious lacuna. Sputum, blood, skin debris, and other body cells are shed by human beings throughout the day. The presence of a piece of hair, skin debris, or sputum at the site of a death caused by a car accident will lead to your suspicion. The fact that you are suspect despite your non-involvement in crime can be an awkward situation. As a result, the quality of the evidence that must be provided in order to establish culpability will be contaminated.

There is little discrimination between people based on DNA profiling as the technique is largely neutral²⁷. Law enforcement agencies, who are directly and pervasively controlled by the state, are the problem. State bias may exist in the present world scenario when it comes to the treatment of people of different religions, castes, races, classes, and genders. DNA profiling, therefore, becomes a weapon in the hands of the government when directed towards the

²⁴ Sharma & Brij Kishore. Introduction to the Constitution of India. PHI Learning Pvt. Ltd., 2022.

²⁵ Bennett & Caroline. "Who knows who we are? Questioning DNA analysis in disaster victim identification." 33.3 *New Genetics and Society*: 239-256(2014).

²⁶ Juyal & Rebant. "Regulation & Use of DNA Profiling in India." *QMLJ*: 36 (2021).

²⁷ Coquet, Margaux & Nuria Terrado-Ortuño. "Forensic DNA phenotyping: Privacy breach, bias reification and the pitfalls of abstract assessments of rights." 25.3 *International Journal of Police Science & Management*: 262-279 (2023).

surveillance of the targeted lot. There is a direct correlation between the length of the data and the vulnerabilities of the record. There seems to be a one-way tunnel in the draft bill encompassing everything that would make a person attractive for inclusion in a database. As specified in the schedule of the DNA Profiling Bill 2017, it will encompass all crimes incriminated in the schedule²⁸.

VI. CASE LAWS

In the field of criminal investigation, DNA evidence has been proven to be relevant by a number of renowned case laws:

1. **Gautam Kundu vs. State of West Bengal (1993)**²⁹: As a result of this case, it is clear that Article 20(3) of the Indian Constitution, as well as section 112 of the Indian Evidence Act, are perfectly understood in this case. To carry out DNA research, an individual cannot be forced to provide a body sample, contrary to the fundamental principle of law.
2. **Rajli Rajjo vs. Kapoor Singh and Ors. (2013)**³⁰: The Punjab and Haryana High Court recently decided a case involving a criminal investigation and evidence collected from the crime scene. The DNA samples served as a blueprint for proving the accused's innocence.
3. **Javed Rehman Shaikh vs. State of Maharashtra (2021)**³¹: The methodology is relevant in this case because DNA testing is part of the evidence. To match the samples, nail clippings and blood samples were taken, and the offender was caught with the help of these samples.
4. **Tandoor case**³²: DNA testing was also used to determine her identity. It was in 2003 that a Delhi court convicted Sushil and sentenced him to death. As a result of the Delhi High Court's decision in 2007, his sentence was upheld. His death sentence was commuted to life in prison by the Supreme Court in 2013.

²⁸ Amulya & Nareem VNSS. "DNA Profiling & Forensic Science: From Tracing Evolutionary Discoveries to the DNA Technology (Use & Application) Regulation Bill, 2018."9 *Supremo Amicus*: 163 (2019).

²⁹ *Gautam Kundu vs. State of West Bengal*(1993),1993 AIR 2295

³⁰ *Rajli Rajjo vs. Kapoor Singh and Ors.*(2013), Civil Revision No.5090 of 2012 (India)

³¹ *Javed Rehman Shaikh vs.State of Maharashtra* (2021), Criminal Appeal No.2787 of 2024 (India).

³² *State vs Sushil Sharma*,2007 CRILJ 4008 (India)

VII. MEASURE TO STRENGTHEN THE RIGHT TO PRIVACY

In order to protect privacy rights, several measures can be taken when DNA evidence is used in criminal investigations. By taking these measures, DNA can be used to solve crimes while ensuring individuals' privacy is protected. Among the most important measures are:

- **Defining legal requirements for DNA collection, use, and storage:**

DNA collection, use, and storage should be regulated and limited to cases in which they are absolutely necessary, like serious crimes. It is important for legislation to prevent DNA collection that is arbitrary or widespread.

- **DNA Collection:**

Individuals should give informed consent before their DNA is collected, except when it is Legally required (e.g., under court orders). The use, storage, and protection of their DNA should be explained to them in full.

- **Database Limitations:**

It is illegal to store DNA collected during criminal investigations for an indefinite period or to use it for any purpose other than that of the investigation without proper legal authorization. Defendants' DNA profiles should be removed from national DNA databases after they are acquitted, and the scope of the databases should be limited.

- **Providing Redress for Privacy Violations:**

As a result of the misuse of DNA evidence, individuals' privacy should be compromised and they should have legal recourse, which includes challenging unauthorized DNA collection, storage, or disclosure, as well as claiming compensation for privacy violations.

- The use of DNA evidence in criminal investigations can be regulated by implementing these measures and safeguarding the fundamental right to privacy of individuals.

(A) Limitations of the Study

- i. This study deals with only criminal investigations.
- ii. This study focuses only on Article 21, right to Privacy and not Article 20(3).

VIII. CONCLUSION

There are two sides to technological advancement in society. Using destructive technologies is the way human minds commit crimes. To do so, legislators must be innovative and require the use of new technology during criminal investigations and liability determinations. With DNA

profiling, the investigators can get more power to ensure justice is delivered more effectively and improve the delivery of criminal justice in the country, based on the all-encompassing scientific technology. Specific provisions of the Bill include establishing a statutory DNA Profiling Board and prohibiting the extraction of information other than DNA profiles for purposes of identifying people. In spite of DNA profiling's importance, its reliability, effectiveness, and adherence to privacy remain in question. Having declared privacy a fundamental right, the Supreme Court judgment has given this debate new dimension. It is recommended by the Supreme Court that a robust privacy protection regime is crafted to balance individual interests with legitimate concerns of the government. It is a complex process for the state to formulate a data protection regime, according to Justice Chandrachud, in accordance with other values that data protection serves and government concerns, the privacy requirements must be carefully balanced. To identify "key data protection issues" and present a draft of a data protection law, the government formed a committee on July 31, 2017. The committee was chaired by former Supreme Court judge Justice B.N.Srikrishna. An ineffective data protection law will give DNA profiling boards broad powers in the absence of a proficient data protection law. In addition, it is suggested that the technique should be applied only with the consent of the suspect, as with narcotics and brain mapping tests. As a result, states must ensure that DNA Profiling legislation adheres to constitutional mandates when it comes to proposed legislation that threatens privacy.

(A) Future Scope

A future study could expand this study to determine the broader implications of Article 20(3) with regard to self-incrimination, which was solely focused on criminal investigations in this study. A more holistic understanding of individual rights during criminal investigations could be gained by investigating the intersection between these two constitutional provisions. This study relied on secondary data because access to professionals outside of India is limited. Engaging legal professionals, investigators, and scholars from multiple jurisdictions to conduct a comparative analysis of privacy rights and criminal investigation protocols might be a promising direction for future research. With this approach, it will be possible to gain a better understanding of how different legal frameworks balance privacy with investigation, providing a global perspective on the issue.

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