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Evidentiary value of DNA Criminal Justice System

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Abstract

Forensic science is an important tool for investigation which helps in the criminal justice system. DNA is the blue print of individual which helps in the crime investigation. DNA decides a person's characteristics such as skin color, nails, etc. DNA profiling process involves extracting the DNA from a specimen such as semen, blood or tissue and chemically dividing the DNA into fragments. DNA profiling helps to identify the victim and accused and to establish the missing link between crime, criminal and the victim. In different countries there is specific legislation relating to admissibility of DNA evidence but in India there is no specific legislation dealing with admissibility of DNA evidence. In the Constitution of India Article 20(3) and Article 21 also imposes limitation regarding admissibility of DNA evidence. In many judicial decisions DNA evidence has been given a value but it always needs to be corroborated with the other circumstantial evidence. Hence in absence of proper legislation and guideline responsibility lies on the judiciary regarding admissibility of DNA evidence.

Keywords: DNA, forensic, evidentiary value, legislation, admissibility

Introduction:

Investigation is the process of gathering evidences but investigation has certain weak points, which would defeat the end of justice. The Supreme Court of India stated, It is a general handicap attached to all eyewitnesses, if they fail to speak with precision, their testimony would be criticised as evasive and vague, but on the other hand, if they speak to all the events very well and correctly, their testimony becomes vulnerable to criticism as tutored (Bhag Singh V State of Punjab, 1997). Thus forensic evidence has become solid tool to corroborate the circumstantial evidence. Some of the forensic tools that have increased trust in the administration of justice are medical-legal examination, fingerprinting, serology, toxicology, ballistics, DNA profiling, and various deception detection tests (DDTs), including narco-analysis, polygraph (lie detector), and brain mapping (P-300). (Goswami G. , 2014)Forensic samples plays a remarkablel role in the detection of the crime. Deoxy ribo nucleic acid (DNA) was discovered by Swiss researcher Johannes Friedrich Miescher in 1869 while he was studying blood cells later James Watson and Francis Crick later while doing an experiment found the double helix structure of a DNA which helps to preserve the genetic code of organisms. The full form of DNA is deoxyribonucleic acid. It is found in the chromosomes of the cells of living beings. It is the blue print of the individual. DNA helps to distinguish one individual from other. DNA decides a person's characteristics such as skin color, nails, etc. The structure of DNA varies from person to person. Every individual has the unique characteristics. Identification of an individual using a fingerprint is done using a traditional method and is very accurate according to experts.

Development of DNA technology

DNA was discovered in 1950 which opened a new parameter in the field of investigation. DNA technology was first used in 1985 in the criminal case in (Colin Pitchfork case, 1986) in England(Jefrey et al.1985). DNA not only help to identify the criminals but also to identify the innocent (https://innocenceproject.org). DNA helps not only to identify and also for rehabilitation of the victims which has been reflected in DNA PROKID project. DNA PROKID help to generate two parallel database like first database profiles of children without family and the second database is profiles of missing relative.University of North Texas Center for Human Identification (UNTCHI) and Bode technology has prepared DNA PROKID Kit for the purpose of collecting the samples by eliminating the contamination.

Requirement of DNA Profiling:

DNA is the monozygotic twins, DNA structure is the same because they come forth by the division of a single fertilized egg. Monozygotic twins are generally identical. (Sharma, 2003) DNA profiling helps to identify the mutilated non identified bodies, identity of the deceased can be established by comparing his DNA profile with those from his suspected parents, sons, daughters, etc. The success of DNA analysis in post mortem samples depends on the state of decomposition of body. The currently developing techniques of DNA profiling promise a degree of accuracy greater even than current methods of finger printing suspects. DNA profiling allows examination of human biological materials at its most fundamental level - the deoxyribonucleic acid (DNA) molecule. This molecule which is found in every living cell within the body, carries the genetic information that makes one individual separate and distinct from every other individual. The DNA profiling process involves extracting the DNA from a specimen such as semen, blood or tissue and chemically dividing the DNA into fragments.DNA profiling was introduced in 1986 using meticulous probe technique (MLP) which was little bit advance on the conventional blood grouping techniques. It was replaced by the single probe method (SLP) which was more sensitive and could be used on smaller amounts of material. In 1994 Forensic Science Service (FSS)introduced a new technique of DNA profiling on the basis of polymerase chain reaction technique (PCR) whereby targeted area of DNA can be induced to clone itself by controlled cycles of heating and cooling

It is difficult to overstate the influence forensic DNA has had on our contemporary society. It has changed how we view earlier societies and is still a disruptive technology that is reshaping how everything operates. In addition to enabling human identification from biological material, advances in DNA analysis have substantially expanded the types of biological material that may be analysed. (Dube)A suspect is required to give blood sample for the purpose of DNA profiling which is required for

- Identification of blood available in the crime scene
- Exclusion of his own blood found on his body or cloth or weapons

Victims of crime may also be asked to provide blood sample for DNA profiling but this cannot be demanded. It is required for:

- Identification of the crime scene
- Exclusion of any DNA found at the crime scene
- To find out any relation with any blood found on the suspect's cloth
- To find relation with any blood found on potential weapons

Admissibility of DNA as Forensic Evidence in Court:

Presently there is no such specific legislation about the acceptability of the DNA test only it has been incorporated under Section 45 of the Indian Evidence Act 1872 through the provision of expert evidence. In the Constitution of India Article 21 has great significance and Supreme Court in **Goutam Kundu v State of West Bengal**[1] held that Court cannot order blood sample as a matter of Course but different investing agencies are in the favour of this DNA legislation so that people can be forced to have this DNA test. In India DNA test gained legal recognition in 1989 in the case of **Kunhiraman v Manoj (1991) 3 Crimes 860(Ker)** it was the first paternity dispute where court ordered for DNA testing and court accepted it under Section 45 of the Indian Evidence Act 1872. Presently there are very few centers in India for DNA testing like Centre for Cellular and Molecular Biology (CCMB), Hyderabad, Andhra Pradesh Forensic laboratory, and Rajiv Gandhi Centre for Biotechnology. Blood stains, hair roots, and bodily fluids are common biological evidence that the accused who committed murder leaves at the crime scene. Many times, the accused may have blood-stained items like a weapon, a sword, or blood-stained clothing taken from his or her possession. All of these tangible proofs are valuable for DNA testing, which proves the defendant was there at the scene of the crime. through the CBI, **Santhosh Kumar Singh v. State (**(2010) 9 SCC 747) law student Priyadarshini, was discovered raped and killed at her home by Santhosh Kumar, his senior. In the course of the investigation, a post-mortem was performed, and DNA testing was done on the sample. Rape was ruled out in the post-mortem report. However, the victim's rape was verified by DNA testing. The Indian judiciary has employed DNA widely for nearly three decades to decide both civil and criminal cases. DNA has a variety of uses in the administration of justice, including the ability to establish an accused person's guilt as well as their innocence. Even in terrible crimes like rape and other bodily offences, employment of DNA is far from satisfactory given the volume of crime in India. (Goswami G. , Role of Forensics in Strengthening child right under the POCSO Act, 2012)Serological analysis aids the court in determining if a blood sample under scrutiny is from a human, (Nagesh v. State of Karnataka , 2020)However, a more sophisticated method for more accurate human identification is the DNA profile. The incredible power of DNA in "The science of DNA profiling has been so perfected that unless the procedure is compromised, the accuracy of the result cannot be questioned, When DNA profiling is done properly its results are infallible", according to Tripura High court. (Nagesh v. State of Karnataka , 2020) The effectiveness of DNA in the legal system has been discussed by the High Court of Karnataka. (Ramu v. State of Karnataka , 2020).

Outcome of DNA Analysis in Criminal Investigation:

1. Inclusion: When the DNA profile of a known individual matches the DNA profile from the crime scene evidence, the individual is "included" as a potential source of that evidence.
2. Exclusion: When the DNA profile from an individual does not match the DNA profile generated from the crime scene evidence, the referenced individual is "excluded" as the donor of the evidence.
3. 3)Inconclusive: Inconclusive results indicate that DNA testing did not produce information that would allow an individual to be either included or excluded as the source of the biological evidence.

[1] 1993 (3) SCC 41

Role of DNA in Criminal Cases:

In India there are many incident of crime in which DNA admissibility can lead to detection of accused identify victim and to form the link between criminal and victim. . The different types of crimes where DNA evidence can play an important role are murder, culpable homicide, rape, dowry death and many others. The rate of such crime in different states in the year 2022 are listed below according to NCRB data

Sl. No.	State/UT	Murder	Culpable Homicide not amounting to Murder	Dowry Death	Rape
1	Andhra Pradesh	925	128	100	621
2	Arunachal Pradesh	56	2	0	74
3	Assam	1072	58	175	1113
4	Bihar	2930	111	1057	881
5	Chhattisgarh	1013	50	57	1246
6	Goa	44	4	0	73
7	Gujarat	959	125	10	610
8	Haryana	1020	78	234	1787
9	Himachal Pradesh	85	11	1	359
10	Jharkhand	1550	57	208	1298
11	Karnataka	1404	88	165	595
12	Kerala	334	94	11	814
13	Madhya Pradesh	1978	185	518	3029
14	Maharashtra	2295	245	180	2904
15	Manipur	47	1	0	42
16	Meghalaya	72	3	1	75
17	Mizoram	31	11	0	14
18	Nagaland	21	6	0	7
19	Odisha	1379	38	263	1464
20	Punjab	670	262	71	517
21	Rajasthan	1834	79	451	5399
22	Sikkim	9	0	0	13
23	Tamil Nadu	1690	86	29	421
24	Telangana	937	256	137	814
25	Tripura	109	0	25	62

26	Uttar Pradesh	3491	1240	2138	3690
27	Uttarakhand	187	43	70	867
28	West Bengal	1696	234	406	1111
Total State (S)	Total State (S)	27838	3495	6307	29900
29	Andaman and Nicobar Islands	7	3	0	12
30	Chandigarh	18	6	1	78
31	Dadra and Nagar Haveli and Daman and Diu	16	1	1	9
32	Delhi	509	90	131	1212
33	Jammu and Kashmir	99	25	9	287
34	Ladakh	5	0	0	5
35	Lakshadweep	0	0	0	4
36	Puducherry	30	1	1	9
Total UT (S)	Total UT (S)	684	126	143	1616
Total All India	Total All India	28522	3621	6450	31516

Fig. 1: Source: Crime in India. NCRB, Government of India.

Regarding the admissibility of DNA evidence in different criminal cases gathering, packaging, and shipping processes (which guarantee the integrity of the chain of custody) as well as sound laboratory procedures are also necessary for the admissibility of the evidence. The reliability of an expert's opinion is influenced by a number of variables. In this regard, a person's experience and qualifications as an expert, the laboratory's accreditation, and procedures are essential for quality management and control. It's crucial to steer clear of claims like manipulating the evidence. In this situation, the accused may receive the benefit of the doubt because of the weak scientific and analytical procedures. (Srivastava, 2022). There have been several high-profile rape and brutal murder cases in India where DNA evidence helped the prosecution secure a conviction. These cases include the **Tandoor case** (Sushil Kumar vs State (N.C.T of Delhi) , 2014) **(also known as the Naina Sahni case**; DNA testing was done on the victim's burned remains in the tandoor). **State v. Nalini (1999) 5 SCC 253 i**n this case Rajiv Gandhi the former Prime Minister of India, was assassinated by a human bomb. DNA test was conducted. DNA profiling assisted to identify the victims and also helped to identity of the perpetrators through the belt collected from the crime scene where there was found body flesh tissue. In **Nirbhaya case,** (Mukesh V State(NCT Delhi), 2017)where the victim, was molested heinously in bus by four notorious criminals by virtue of which many organs of the victims were destroyed. Supreme Court matched evidence of the accused's presence in the bus and their involvement in the offence from DNA identification, fingerprints, witness accounts, and odontology. In **Santosh Kumar Singh vs State through CBI (2010) 9 SCC 747** case a law student Priyadarshini was found dead in her home after being raped. A post-mortem was performed as part of the investigation, and DNA testing was also done on the samples. The post-mortem

investigation excluded rape. However, the victim's rape was confirmed by the DNA test.The Supreme Court noted that among other circumstantial evidences, DNA evidence plays a significant role in convicting the genuine offender. If DNA evidence has established the rape in a case involving both rape and murder, the prosecution can simply establish the accused's guilt of murder beyond a reasonable doubt. In **Sushil Kumar vs State (N.C.T of Delhi) (2014) 4 SCC 317,** Sushil Sharma shot and killed his wife Naina before attempting to burn her body in a tandoor. Police found a pistol and transferred blood-stained clothing for forensic analysis. Parents' blood samples were obtained. The burnt body was that of their daughter Naina Sahni, according to the DNA analysis. The court noted that only circumstantial evidence was used to support this case. The identification of Naina Sahni's burned body in this case relies heavily on the DNA evidence.The significance of forensic expert reports was examined by the Supreme Court. In **Surendra koli vs State of U.P. (2011) 4 SCC 80,** case accused were convicted under Sections 302/364/376 of the Indian Penal Code, 1860 by Special Sessions Trial. Identity of the dead body was established by the DNA test. The DNA test was conducted by matching her DNA with that of her parents and brother. In **State (NCT of Delhi) v. Badruddin**,[2] case the accused was charged for penetrative carnal intercourse with nine years old boy who stayed in the neighbourhood of the accused. DNA test was conducted on the anal swab and the blood stain and semen stain found on the clothes of the victim and consequently it matched with that of the accused. This evidence corroborated the commission of the offence which automatically resulted in conviction of the accused. When describing the DNA analysis method in **Manoj v. State of Madhya Pradesh (2022),** the expert omitted mentioning the "random occurrence ratio." As one of the reference samples was taken from an open place, the court determined that there was a chance of contamination. In **Swami Sharddananda Alias Murli Monahar Mishra v State of Karnataka**, 2008 13 SCC 767 case identity of the skeleton of the deceased was eastablished on the basis of DNA fingerprinting on which the expert opinion was also taken after the report of the forensic laboratory and consequently accused was charged under Section 302 of IPC.

DNA Profiling and Indian Legal System:

Since 2003, India has been working to create its own National DNA Data Bank. For the objective of increasing the effectiveness of justice delivery in India, the development of a digital DNA data bank is considered to be essential. The DNA profiles that have been contributed to the data bank can strengthen the criminal investigative process and increase the likelihood that offenders will be found guilty. (Manpreet Dhillon, 2021)The admissibility of the DNA evidence before the court always depends on its accurate and proper collection, preservation and documentation which can satisfy the court that the evidence which has been put in front it is reliable. There is no specific legislation which is present in Indian which can provide specific guidelines to the investigating agencies and the court, and the procedure to be adopted in the cases involving DNA as its evidence. In the old legislation like CRPC, IPC there was no direct sections relating to conduct of DNA test. Section 51, 52 and 53 of BNSS speaks about the provision of medical examination and 176(3) of BNSS provides for compulsory forensic examination for the offences punishable with seven years or more has been committed.

[2] 2015 LawSuit (Del) 2585

Challenges:

1. Infringement of fundamental right

The introduction of the DNA technology infringe "Right to privacy" under Article 21 and "Right against Self-incrimination" under Article 20(3) for which courts 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 21of 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 Supreme Court in some of its decisions has imposed limitations on the exercise of fundamental rights. In **Govind Singh v. state of Madhya Pradesh**, AIR 1975 SC 1378, (1975) 2 SCC 148 Supreme Court held that a fundamental right must be subject to restriction on the basis of compelling public interest. In another case **Kharak Singh v. state of Uttar Pradesh**, AIR 1963 SC 1295 Supreme Court held that Right to privacy is not a guaranteed right under our Constitution. It is clear from various decisions which 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 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. According to the Law Commission of India, (41st Report on The Code of Criminal Procedure, Law Commission of India, Government of India, Sept. 1969)"The commission has considered at length the question as to how far the physical examination of the arrested person is legally and constitutionally permissible and what provision, if any, should be made for the purpose of the code. It was determined that a provision on the issue was necessary, and it was suggested that a new section be added that would permit, under specific conditions and with certain safeguards, the accused's person to be examined by a licenced medical professional. We concur that such a provision will not violate Article 20(3) of the Constitution and is necessary for an efficient investigation. Taking the blood sample under the watchful eye of the law is neither cruel, disrespectful, or surprising." Chapter 53 of the Code imposes a responsibility on the person who has been arrested to submit to a medical examination at the request of a police officer in order to aid the inquiry. The constitutional requirement does declare that no one shall ever be deprived of his or her own freedom. In **Ananth Kumar Naik v. State of Andhra Pradesh,** MANU/AP/0220/1977 case Andhra Pradesh High Court held that The Court stated that "Examination of a person by a medical practitioner must logically take in examination by testing his blood, semen, urine, etc." when examining the application of Section 53 of the Criminal Procedure Code. The Court Again Allahabad High Court in **Jamshed v. State of UP**, MANU/UP/0239/1976 case the Court concluded that I have also adopted the position that, even though Indian law does not specifically permit the collecting of a blood sample, "examination of a person" in a criminal case encompasses both the taking of a blood sample and the examination of any internal organ. It has been noted that obtaining a blood sample is not considered to be unpleasant or startling to the conscience in today's society and cannot be claimed to be offensive or against common decency. As a result, Section 53 of the Code may allow for even little pain during the process. In **Neeraj Sharma v. State of U.P** MANU/UP/0248/1992When addressing the authority of the Magistrate to order a medical examination under Section 53 of the Code, the Allahabad High Court held as follows: "It will not be proper to give a restricted meaning to the word 'examination' used in Section 53 of the Code. In order for a doctor to

render an opinion, he or she may wish to examine the accused thoroughly using all available modern and scientific tools. This examination should not be limited to a cursory examination that involves only looking at the accused's body. More recently, the Supreme Court stated in the case of **Selvi,** (Smt. Selvi v. State of Karnataka , 2010) citing Kathi Kalu, that Article 20(3) is intended to prevent the compelled conveying of intimate knowledge that is pertinent to the facts at hand. It is impossible to classify the results of polygraph, narcoanalysis, and brain electrical activity profiling as physical evidence like human fluids and other tangible objects because they have a testimonial quality. The Court acknowledged that whereas body materials including blood, semen, sweat, hair, and fingernail clippings, as well as DNA profiling, can be considered physical evidence, the same cannot be true for the techniques in question.

2. Evidentiary Value

DNA is not thought to be a concrete piece of proof; rather, it is only an expert judgement that can be used to corroborate other evidence. The admissibility and relevance of expert opinion are covered by the Indian Evidence Act of 1872 (Dube D. , 2012) . An expert is a person who has spent a lot of time studying a certain field of knowledge and is therefore particularly knowledgeable on the subjects on which he is asked for his opinion. There are no specific exams established by legislation to establish the level of training or experience a person must have to be considered an expert. (State of Himachal Pradesh v. Jai Lal , 1999)The expert's report is not admissible until the affected party has had a chance to cross-examine him and the expert has been deposed as a witness. A conclusion made by an expert that is not backed up by evidence must also be disregarded. Therefore, DNA evidence may be considered acceptable as expert opinion under Indian law. Although the correctness, dependability, and certainty of its conclusions have been taken into consideration, it is treated on an equal footing with other scientific or expert information and has not been given any special weight. According to Indian law, a DNA test may be performed during an investigation by the police if they believe it will provide proof that the crime was committed. This proof may then be introduced during a trial as expert testimony under Section 45 of the Act. Based on his expertise and subject knowledge, the expert must persuade the court of the mode of conduct, authenticity, and accuracy of the findings. The Court may form an opinion based on the findings, which it may then accept if it seems likely in light of other evidence.

Merits of DNA as Forensic Evidence:

1. Reliability: Evidence of eye witness are contradictory in many cases so DNA testing is much more reliable than the evidence of eye witness.
2. Justice correction: DNA test has lead to the release of those convicts who were wrongly punished.
3. Speedy Disposal: As in most of the DNA testing gives accurate result so most of the accused who are wrongly convicted can be released during the initial testing of physical evidence at the stage of investigation or still pending case in the court.

Demerits of DNA testing:

Contamination: As DNA is collected from the crime scene in several cases from biological and non biological sources contamination occurs like many blood samples come into contact with each other at the crime scene like dirt, heat, uv rays, etc.

Conclusion:

Examining the evidence leads to the conclusion that, given the "progress" of criminals and changes in crime patterns, it is absolutely necessary tosystematically conduct inquiries and allow for the admission of any and all scientific evidence in court. Many unresolved crime cases can be resolved with the help of forensic evidence, including DNA analysis. If the investigating officer had properly and promptly gathered the DNA evidence, the murder of Arushi Talwar-Hemraj would not still be a mystery today. Forensic evidence has, to date, assisted in the resolution of numerous complex cases, and because of factors like correctness, dependability, and authenticity, forensic evidence is given a very high evidentiary value in court. The science of forensic evidence is currently developing and evolving, necessitating changes to the nation's current laws, particularly in light of forensic evidence. The DNA Technology Regulation Bill, 2019, is a positive move, but the government should make sure that all the concerns related to its implementation are comprehensively addressed. In conclusion, the use and acceptance of forensic and DNA technology can prove to be a significant advancement in the criminal justice system. Therefore, it is essential to properly codify the laws governing forensic evidence and to institutionalize reliable forensic laboratories.

Suggestion

1. The requirement for efficacy under the expanded advancements of forensic evidence's collection methodologies under the authority or jurisdiction of the Police Act, 1861, is extremely important or required on a wider scale. In other words, they easily with lack of concrete or strong evidence gets an easier acquittal from the Hon'ble Court of Law because without any reformation under the Police Act, 1861, the Forensic Evidences have been left unexposed and the Police Authorities are not having such bright or broad knowledge about these things.
2. According to the Police Act of 1861, there will be a pressing need in the scientific and forensic fields that must involve forensic instruments or methodologies for collecting forensic evidence, or police authorities must be aware of or receive basic training in the collection of forensic evidence through various means of criminal agencies like the NIA (National Investigation Agency), CBI (Central Bureau of Investigation), and others.

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