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The Role of DNA in Criminal Investigation – Admissibility in Indian Legal System and Future Perspectives

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ABSTRACT: *DNA profiling is a technique by which an individual can be identified at molecular level. The use of DNA evidence in criminal investigation has grown in recent years. DNA testing has helped low enforcement identify criminals and solve difficult crime such as rape, murder and murder with rape etc. The potential of DNA typing has made possible the resolution of immigration problems and complicated paternity testing when the father is not available. Rapid identification of individuals in mass-disaster (man- made such as-explosions) using DNA typing has also been possible .computerized DNA database for the identification of criminal offenders have been created in some countries. DNA is a powerful investigative tool because, with the exception of identical twins, no two people have the same DNA. In other words, the sequence or order of the DNA building blocks is different in particular region of the cell, making each person's DNA unique. No doubt, DNA has great importance in criminal investigation cases such as-murder, rape, disputed paternity, man-made disaster etc., still there is no specific provisions under Indian Evidence Act-1872 and Code of Criminal Procedure -1973 to manage forensic science issues. This paper examines the science of DNA identification and its use during criminal investigations and in criminal proceedings, including criminal trials, appeals and post-conviction proceedings. It describes the main benefits and costs of the increasing role of DNA identification in the criminal justice system with special emphasis to India. We hope that the challenges of DNA technologies will be solve in future.*

KEYWORDS: *DNA Profiling, Inclusion, Exclusion, Inconclusive, Manupatra, IPC, Cr. P. C., Indian Evidence Act and Criminal Justice System.*

I. INTRODUCTION

DNA (Deoxyribonucleic acid), sometimes called the building block or genetic blueprint of life, was first described by the scientists Francis H. C. Crick and James D. Watson in 1953. Crick and Watson identified the double-helix structure of DNA, which resembles a twisted ladder, and established the role of DNA as the material that makes up the genetic code of living organisms. The pattern of the compounds that constitute the DNA of an individual life-form determines the development of that life-form. DNA is the same in every cell throughout an individual's body, whether it is a skin cell, sperm cell, or blood cell. With the exception of identical twins, no two individuals have the same DNA blueprint.

In DNA analysis for a criminal investigation, using highly sophisticated scientific equipment, first a DNA molecule from the suspect is disassembled, and selected segments are isolated and measured. Then the suspect's DNA profile is compared with one derived from a sample of physical evidence to see whether the two match. If a conclusive non-match occurs, the suspect may be eliminated from consideration. If a match occurs, a statistical analysis is performed to determine the probability that the sample of physical evidence came from another person with the same DNA profile as the suspect's. Juries use this statistical result in determining whether a suspect is guilty or innocent.

II. LEGAL DEFINITION OF DNA

Among the many new tools that science has provided for the analysis of forensic evidence is the powerful and controversial analysis of deoxyribonucleic acid, or DNA, the material that makes up the genetic code of most organisms. DNA analysis, also called DNA typing or DNA profiling, examines DNA found in physical evidence such as blood, hair, and semen, and determines whether it can be matched to DNA taken from specific individuals. DNA analysis has become a common form of evidence in criminal trials. It is also used in civil litigation, particularly in cases involving the determination of Paternity of Identity.

Interpreting Results of DNA Analysis in Criminal Investigation

1) **Inclusion:** When the DNA profile of a known individual (A victim or suspect) 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 (A victim or suspect) does not match the DNA profile generated from the crime scene evidence, the referenced individual is "excluded" as the donor of the evidence.
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.
4) **Queries regarding DNA analysis among common people**
5) If I am arrested by the police for a crime, do the police have the right to order me to provide a DNA sample for their criminal investigation?
6) If a family member commits a crime, can his DNA at the crime scene lead law enforcement to wrongly believe that I committed the crime? How similar is DNA among family members?
7) What procedures can I take if I believe that DNA evidence found at a crime scene was accidently contaminated by police during the collection process?

DNA Profiling and Indian Legal System

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. Moreover, there is no specific provision under **Indian Evidenced Act, 1872** and **Code of Criminal Procedure, 1973** to manage science, technology and forensic science issues. Due to lack of having any such provision, an investigating officer has to face much trouble in collecting evidences which involves modern mechanism to prove the accused person guilty.

Section 53 of Code of Criminal Procedure1973 authorizes a police officer to get the assistance of a medical practitioner in good faith for the propose of the investigation. But, it doesn't enable a complainant to collect blood, semen etc for bringing the criminal charges against the accused.

The amendment of Cr. P. C. by the Cr. P. C. (amendment) Act, 2005 has brought two new sections which authorize the investigating officer to collect DNA sample from the body of the accused and the victim with the help of medical practitioner. These sections allow examination of person accused of rape by medical practitioner and the medical examination of the rape victim respectively. But the admissibility of these evidences has remained in a state of doubt as the opinion of the Supreme Court and various High Courts in various decisions remained conflicting. Judges do not deny the scientific accuracy and conclusiveness of DNA testing, but in some cases they do not admit these evidences on the ground of legal or constitutional prohibition and sometimes the public policy. There is an argent need to re-examine these sections and lows as there is no rule present in the Indian Evidence Act, 1872 and Code of Criminal Procedure, 1973 to manage science and technology issues.

Many developed countries have been forced to change their legislation after the introduction of the DNA testing in the legal system. There are certain provisions which are present in the Indian Evidence Act, 1872 such as section 112 which determine child's parentage and states that a child born in a valid marriage between a mother and a man within 280 days of the dissolution of the marriage, and the mother remaining unmarried shows that the child belongs to the man, unless proved otherwise but again no specific provision which would cover modern scientific techniques. DNA analysis is of utmost importance in determining the paternity of a child in the cases of civil disputes. Need of this evidence is most significant in the criminal cases, civil cases, and in the maintenance proceeding in the criminal courts under Section 125 of the Cr. P. C.

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. In Govind Singh v. state of Madhya Pradesh, 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 utter Pradesh, 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 lows 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.

The recent refusal of the Supreme Court to dismiss the Delhi High court's decision ordering veteran congress leader **N.D. Tiwari** to undergo the DNA test is very important from the viewpoint of the admissibility of such evidence. In this case, **Rohit Shekhar** has claimed to be the biological son of **N.D. Tiwari**, but **N.D. Tiwari** is reluctant to undergo such test stating that it would be the violation of his Right to privacy and would cause him public humiliation. But Supreme Court rejected this point stating when the result of the test would not be revealed to anyone and it would under a sealed envelope, there is no point of getting humiliated. Supreme Court further stated that we want young man to get justice; he should not left without any remedy. It would be very interesting to see that how courts in India would allow the admissibility of **DNA** technology in the future.

International Perspective on Admissibility of DNA in Criminal Justice System

1) In the 1950s, Anna Anderson claimed that she was Grand Duchess Anastasia Nikolaevna of Russia. In the 1980s, after her death, samples of her tissue that had been stored at a Charlottesville, Virginia hospital following a medical procedure were tested using DNA fingerprinting, and showed that she bore no relation to the Romanovs.
2) In 1986, Richard Buckland was exonerated, despite having admitted to the rape and murder of a teenager near Leicester, the city where DNA profiling was first discovered. This was the first use of DNA finger printing in a criminal investigation.
3) In 1987, genetic fingerprinting was used in criminal court for the first time in the trial of a man accused of unlawful intercourse with a mentally handicapped 14-year-old female who gave birth to his baby.
4) In 1987, Florida rapist Tommy Lee Andrews was the first person in the United States to be convicted as a result of DNA evidence, for raping a woman during a burglary; he was convicted on November 6, 1987, and sentenced to 22 years in prison.
5) In 1989, Chicago man Gary Dotson was the first person whose conviction was overturned using DNA evidence.
6) In 1991, Allan Legere was the first Canadian to be convicted as a result of DNA evidence, for four murders he had committed while an escaped prisoner in 1989. During his trial, his defense argued that the relatively shallow gene pool of the region could lead to false positives.
7) In 1992, DNA evidence was used to prove that Nazi doctor Josef Mengele was buried in Brazil under the name Wolfgang Gerhard.
8) In 1992, DNA from a palo verde tree was used to convict Mark Alan Bogan of murder. DNA from seed pods of a tree at the crime scene was found to match that of seed pods found in Bogan's truck. This is the first instance of plant DNA admitted in a criminal case.
9) In 1993, Kirk Bloodsworth was the first person to have been convicted of murder and sentenced to death, whose conviction was overturned using DNA evidence.
10) The 1993 rape and murder of Mia Zapata, lead singer for the Seattle punk band The Gits was unsolved nine years after the murder. A database search in 2001 failed, but the killer's DNA was collected when he was arrested in Florida for burglary and domestic abuse in 2002.
11) In 2001, Wayne Butler was convicted for the murder of Celia Douty. It was the first murder in Australia to be solved using DNA profiling.
12) In March 2003, Josiah Sutton was released from prison after serving four years of a twelve-year sentence for a sexual assault charge. Questionable DNA samples taken from Sutton were retested in the wake of the Houston Police Department's crime lab scandal of mishandling DNA evidence.
13) In June 2003, because of new DNA evidence, Dennis Halstead, John Kogut and John Restivo won a re-trial on their murder conviction. The three men had already served eighteen years of their thirty-plus-year sentences.
14) The trial of Robert Pickton (convicted in December 2003) is notable in that DNA evidence is being used primarily to identify the victims, and in many cases to prove their existence.
15) In March 2009, Sean Hodgson who spent 27 years in jail, convicted of killing Teresa De Simone, 22, in her car in Southampton 30 years ago was released by senior judges. Tests prove DNA from the scene was not his. British police have now reopened the case.

Indian Perspective on Admissibility of DNA in Indian Legal System

The use of DNA as evidence in criminal investigations has grown in recent years in India. DNA testing has helped law enforcement, identify criminals and solve difficult crimes. On the other hand, DNA evidence has supported proves that many convicted people are actually innocent.

There are 47 decisions during 2011 given by Supreme Court and different Indian High Courts in which the DNA sample played very important role.

Table: 1.1 Name of the courts.

Sl No.	Name of Court	Frequency	Percent
1.	Delhi	11	23.4
2.	Bombay	8	17.0
3.	Kolkata	3	6.4
4.	Madras	6	12.8
5.	Andhra Pradesh	4	8.5
6.	Jabalpur	1	2.1
7.	Guhati	3	6.4
8.	Supreme Court	2	4.3
9.	Chhattisgarh	1	2.1
10.	Punjab &Haryana	4	8.5
11.	Uttar Pradesh	1	2.1
12.	Utrakhand	1	2.1
13.	Kerla	1	2.1
14.	Himachal Pradesh	1	2.1
	Total	47	100.0

Table 1.1 shows about the decisions given by different Indian High Courts during 2011. Most of the decisions are given by The Delhi High Court i.e. 23.4 percent while only 2.1 percent decisions given by six Indian High Courts.

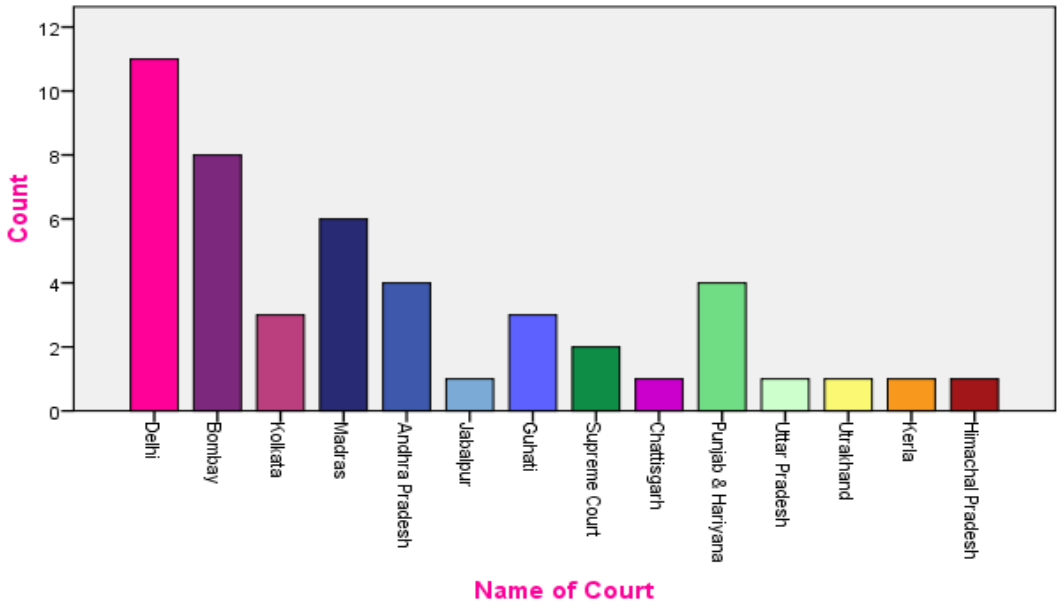


Table: 1.2Decisions given by various Benches of India

Sl No.	Decision Given by Bench	Frequency	Percent
1.	Nagpur	1	14.3
2.	Agartala	2	28.6
3.	Aurangabad	1	14.3
4.	Ernakulam	1	14.3
5.	Madurai	2	28.6
	Total	7	100.0

It shows in Table 1.2 that most of of the decisions (57.2 Percent) given by Agartal and Madurai Benches while in case of Nagpur Aurangabad and Ernakulam branches 42.8 percent respectively.

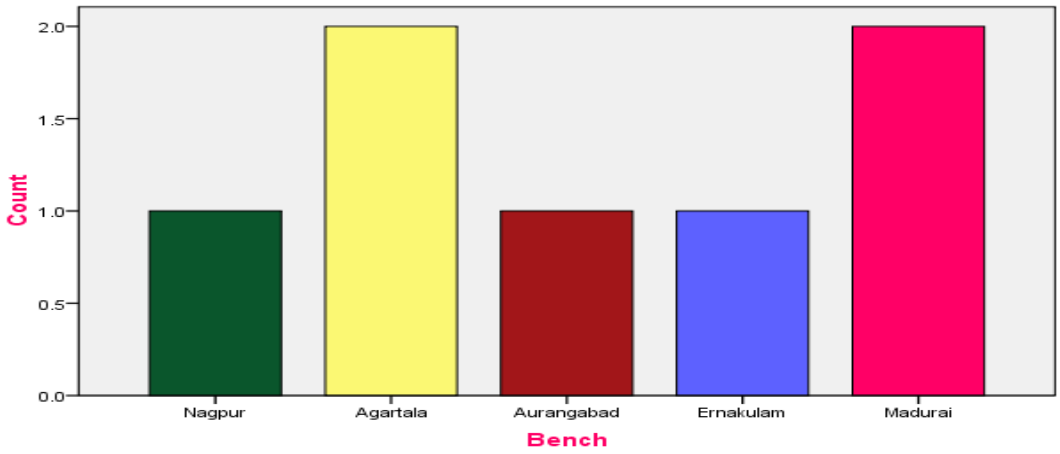


Table: 1.3. Type of Case

Sl No.	Type of Cases	Frequency	Percent
1.	Murder	2	4.7
2.	Rape	3	7.0
3.	Rape with Murder	1	2.3
4.	Identification of Dead Body	3	7.0
5.	Identification of person	17	39.5
6.	Disputed Patemity	15	34.9
7.	Disputed Matemity	2	4.7
	Total	43	100.0

Table 1.3 shows that most of the cases of Identification of the person and disputed paternity i.e. 74.4 percent while in case of murder 4.7 percent and 2.3 percent cases of rape with murder.

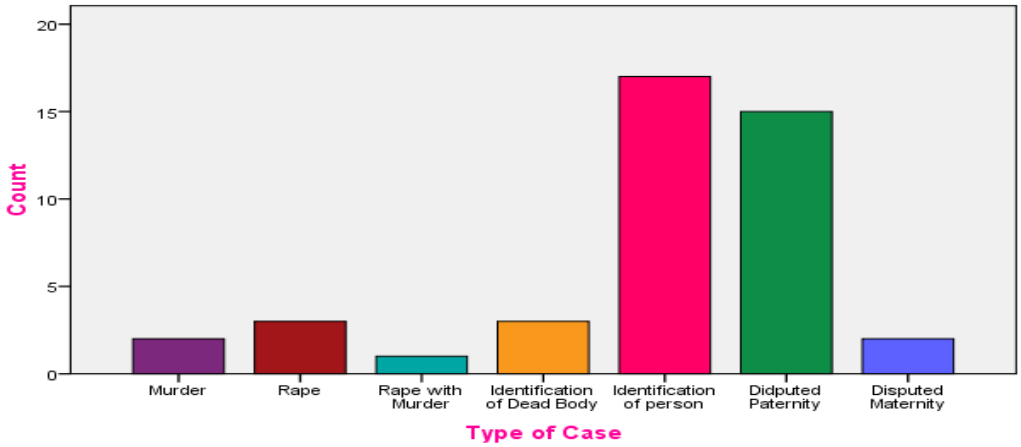


Table: 1.4. Nature of identified samples

Sl No.	Nature of Sample	Frequency	Percent
1.	Blood	21	51.2
2.	Semen	1	2.4
3.	Hair	1	2.4
4.	Teeth	1	2.4
5.	Vaginal Swabs	1	2.4
6.	Semen and Vaginal Swabs	2	4.9
7.	Bone	5	12.2
8.	Femur Bone	1	2.4
9.	Blood and Semen	2	4.9
10.	Blood and Bone	2	4.9
11.	Sweat and Blood	1	2.4
12.	Dead Body	3	4.3
13.	Other	1	2.4
	Total	41	100.0

It is mention in above Table that in 51.2 percent cases in which the DNA samples traced from Blood and 4.9 percent cases the sample took from Blood and Bone while in case of hair and teeth 4.8 percent cases decided.

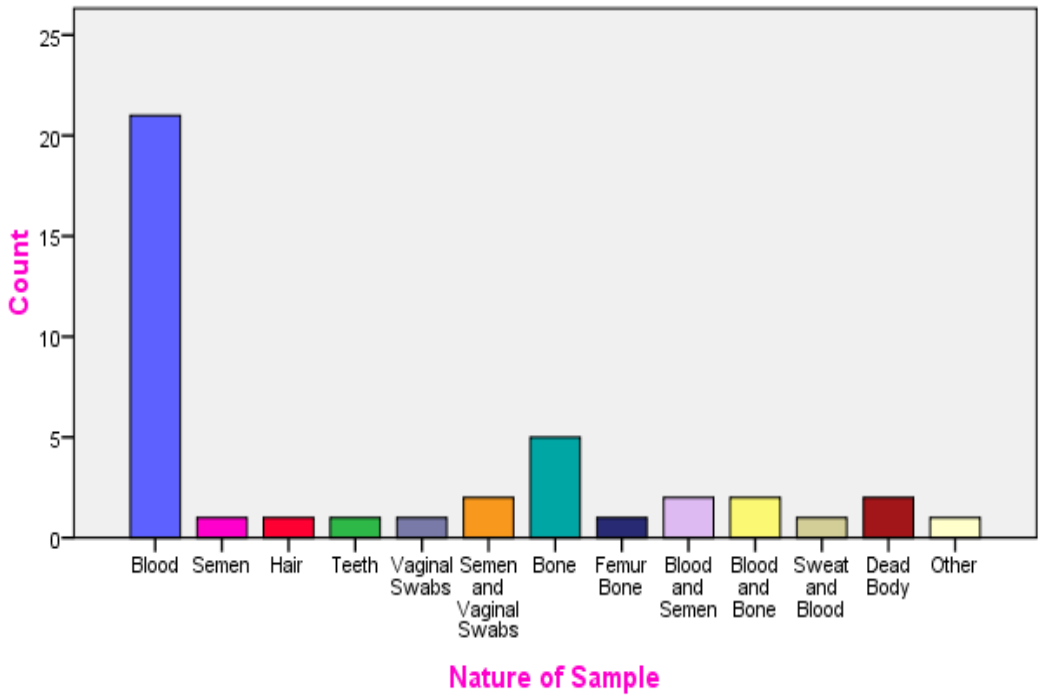
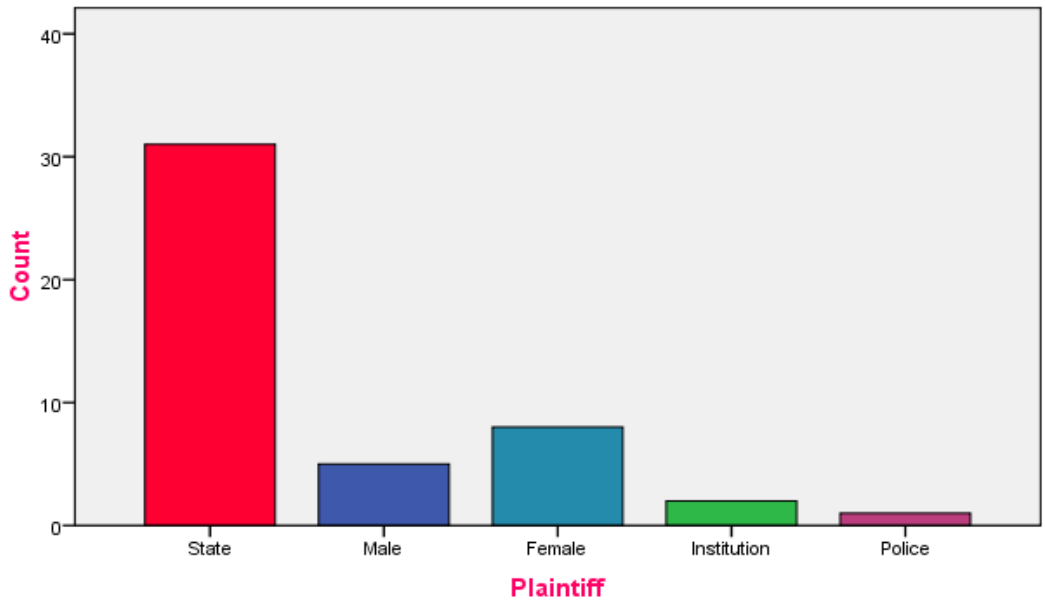


Table: 1.5. Plaintiff

Sl No.	Plaintiff	Frequency	Percent
1.	State	31	66.0
2.	Male	5	10.6
3.	Female	8	17.0
4.	Institution	2	4.3
5.	Police	1	2.1
	Total	47	100.0

It is found in the study that in 66 percent cases the plaintiff was State where the main evidence was DNA and the role of police as a plaintiff only 2.1 percent.



III. CONCLUSIONS AND SUGGESTIONS

Some major findings emerged in the various tables of the study are being acknowledged:

1) Table 1.1 shows about the decisions given by different Indian High Courts during 2011. Most of the decisions are given by The Delhi High Court i.e. 23.4 percent while only 2.1 percent decisions given by six Indian High Courts.
2) It shows in Table 1.2 that most of the decisions (57.2 Percent) given by Agartala and Madurai Benches while in case of Nagpur Aurangabad and Ernakulam branches 42.8 percent respectively.
3) Table 1.3 shows that most of the cases of Identification of the person and disputed paternity i.e. 74.4 percent while in case of murder 4.7 percent and 2.3 percent cases of rape with murder.
4) It is mention in Table 1.4that in 51.2 percent cases in which the DNA samples traced from Blood and 4.9 percent cases the sample took from Blood and Bone while in case of hair and teeth 4.8 percent cases decided.
5) It is found in (Table 1.5) the study that in 66 percent cases the plaintiff was State where the main evidence was DNA and the role of police as a plaintiff only 2.1 percent.
6) There is not made any conviction on the basic of DNA sample as Life Imprisonment or Capital Punishment in India till now but other country.

IV. SUGGESTIONS

Some broad suggestions emerging out of the study can be summarized as below:

1) The Government must make necessary provisions / amendments in the Cr. P. C. for the accused / suspect to provide their DNA sample to the investigating agencies on the direction of competent court.
2) The Government should take speedy measures to create data base of DNA based on ethnic group, anthropological and regional considerations.
3) It is important to create a balance between the constitutional rights of an individual and the public interest and bring accountability and transparency to the practice of DNA collection and testing.

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