Unveiling The Recondite Flawsof Dna Evidence- The Need to Reconsider Its Reliability

[*]Lan Francis [**]Sandeep Menon Nandakumar

**Student BALLB, Bharat Mata School of Legal Student Cochin.*

***Assistant Professor, Reva University, Bangalore.*

Abstract

DNA analysis is conducted almost routinely in the course of criminal trial nowadays in order to establish a link between the suspect and the crime. The overt reliance on DNA can be attributed to the immense likelihood of the presence of DNA in a crime scene, and its easy extractability. Often considered to be an irrefutable evidence, today DNA is placed on a higher pedestal than most other evidences, and has also achieved the status of a circumstantial evidence in the court of law. The paper aims to critically analyse the reliability of forensic evidence obtained from DNA, and expose the recondite dangers associated with the extensive reliance on DNA evidence by the court and law enforcement, citing various international cases which proves the fallibility of DNA evidence.

Keywords: *DNA, Crime, Trial, Enforcement, Forensic.*

I. Introduction

Deoxyribonucleic acid, more commonly known as DNA, is a trace element which has found a tremendous growth in its significance and application as a forensic evidence in criminal investigation. The first application of DNA analysis in criminal investigation dates back to 1986, when Professor Alec Jeffreys compared the DNA extracted from semen for the investigation of two similar murder casesin the UK, where the victims were sexually assaulted.[2] DNA, however, is not confined merely to cases involving sexual assault. It can easily be transferred onto any surface a person comes into contact with, as even the skin cells of a personis said to contain DNA. This feature of DNA has resulted in the extensive reliance on DNA evidence by the police and other investigation agencies, especially in instances involving criminal offences. The issues and debates centred around the use of DNA analysis in criminal investigations have generally been with regard to the conflict between DNA analysis and the right against self-incrimination. In the Indian context, this has been with specific reference to Article 20(3) of the Indian Constitution. The case laws that dealt with such issues include case laws such as State of Bombay v. Kathikalu Oghad[3] to Selvi v. State of Karnataka[4]. This does not, in any way, denotethat the issues were limited only to our jurisdiction. The same issues have made judges in other jurisdictions to analyse the scope of the effect on DNA analysis on the right to privacy and right against self-incrimination. Case laws such as Slaughter v. Oklahoma[5] and Saunders v. UK[6] are examples of such instances which question the admissibility of such techniques.

However, there are more obscure issues connected with DNA profiling, and one of the most pivotal issue is with regard to thereliability of DNA evidence. The ultimate purpose of any criminal trial is to punish the offender, and DNA being oneamongst the most sophisticated tools available in criminal investigation,which is capable of deciding the innocence or guilt of an accused, any fallibility in its reliability would imply the possibility of miscarriage of justice.Science may have made unanimous contributions to the field of law with such advancements, but the question of whether these techniques are completely reliable should not be left unanswered. With

the aim of asserting how DNA can turn out to be a confusing tool which could mislead criminal investigations, the following part of this paper discusses the'Locard's Exchange Principle', an important principle frequently applied in Forensic Science.

II. Locard's Principle- Every Contact Leaves a Trace

The first Forensic Science Laboratory was set up in France around 1900s, and was headed by Sir Edmond Locard. He formulated the 'Locard's Exchange Principle' which states that 'every contact leaves a trace', i.e. whenever two objects come into contact, an exchange of matter takes place.[7] Locard's principle has indeed proved to be true, and every contact one makes is capable of leaving a trace. Infact, a mere touch can result in thetransfer of DNA of one person onto another person, or onto any material objectsthe person comes into contact with. Thus, the probability of finding such evidences in a crime scene is reasonably high, and as a result of this, many of the crime investigations today rely on DNAand similar trace evidences to identify the culprits. The courts in India have recognized DNA to be a predominant forensic technique to identify criminals when biological tissues such as saliva, skin, blood stains, semen etc. are left at the crime scene. As per the observation of the Supreme Court in *Thogorani Alias K. Damayanti v State Of Orissa And Ors*.[8], DNA makes it possible to obtain conclusive results in those cases in which previous testings had been inconclusive. There are a string of other decisions as well, where the court has emphasized on the significance and evidenciary value of DNA, and this clearly indicates that there is anextensive, or maybe an obsessive, reliance placed by the courts on DNA.

While Locard's principle has enabled forensic scientists to identify evidences left by a perpetrator in a crime scene, the core argument raised by the authors of this paper refuting the reliability of DNA evidence is based on this very same principle. As stated earlier, a mere touch, whether intentional or not, could result in the transfer of DNA from one place to the other.Even a person casually walking into a room may leave his/her DNA somewhere inside the room or on any material objects present in the room.[9]It is also possible for DNA to be transferred to a place where a person has never travelled to. The facts of an Australian murder case, commonly referred to as the *Jaidyn Leskiecase*, further substantiates this argument.In this case, the bib and tracksuit pants of a toddler found with the remains of the toddlerwas identified to have DNA on it. The results of the DNA analysis indicated that the DNA belonged to a rape victim, whose case was recently processed in the same lab. Further probe into the case revealed that the transfer actually took place inside the laboratory as they were processed in the same lab.[10]

Therevelations made in this case clearly indicates that it is possible for the DNA of a person to 'travel' to a place he or she has not been to, and this further implies the possibility for an innocent person's DNA to be present in a crime scene, or on any materials recovered from the crime scene, and thereby mislead the investigation. Such situations also indicate the possibility of wrongful convictions of innocent persons. There have been instances where the police and the court has been mislead as a result of excessive reliance on DNA evidence, and some of these cases are discusses below.

III. DNA Evidence and The Risk of Wrongful Convictions

It is true that the presence of DNA samples of an innocent person on a victim may result in the innocent being convicted along with the actual culprit or otherwise. The problem is that, rather than purely relying on facts and evidences collected during investigation, for the purpose of finding the guilty and winding up the case, the police, the prosecutors and even judges tend to rely on fantasies and far-fetched imaginations to put the innocent to trials solely because of the

presence of their DNA samples in the crime scene or on the victim. The case of *Amanda Knox & Raffaele Sollecito*is one such example.

The case is related to the murder of Meredith Kercher, and the arrest of Amanda Knox & Raffaele Sollecito for the same. Though there were cogent evidences to prove that the perpetrator of the crime was Rudy Guede, a criminal wanted in many cases of burglary. Though there were bloody palm print of Rudy on the pillow under Meredith Kercher's body and his DNA inside Meredith Kercher and her belongings, the court refused to convict Rudy alone. The fact that his DNA was also linked to feces left in the toilet and that there has been similar burglary attempts made by him in the past were not enough for the judge to come to a conclusion that Rudy is the sole perpetrator of the murder[11]. The appreciation of evidence and trial has resulted in varying conclusions reached at the trial and appellate stages. Though the initial DNA analysis revealed conclusive evidences to convict Amanda Knox & Raffaele Sollecito in the murder of Meredith Kercher, the independent review of the evidence conducted by the appellate judge revealed that there is no strong presence of DNA in the items subjected to DNA analysis so as to convict Amanda Knox & Raffaele Sollecito[12]. This is a matter of serious concern because if these tests yield different results; it is almost equivalent to creating a faulty criminal justice administration system.

The prosecution had relied on two DNA samples obtained from a large kitchen knife found in Raffaele Sollecito's kitchen and severed clasp of Meredith Kercher's bra. The knife, according to the prosecution, contained DNA samples of Amanda Knox on the handle and DNA samples of Meredith Kercher on the blade. The bra clasp had DNA samples of Raffaele Sollecito. In ordinary circumstances, one may wonder what more is to be required to convict a person. However, this case does not fall under such ordinary circumstances. This is a case where the actual offender, Rudy Guede, has left his DNA traces all over the victim and crime scene and the prosecution, for some unknown reasons, showed interest in putting Raffaele Sollecito and Amanda Knox behind the bars. The lab tests on the knife recovered from Raffaele Sollecito's kitchen revealed that there was no presence of blood on it. The independent review conducted on the knife and bra clasp during the appellate stage proved that there are no sufficient traces of DNA of Amanda Knox and Raffaele Sollecito so as to convict them for the murder of Meredith Kercher. The independent review also revealed that it is strange to have considered the particular bra clasp for lab tests as the same was recovered from the crime scene after 47 days and contained several dust and other particles that made DNA analysis futile. Based on the independent review, it could be concluded that the DNA traces of Meredith Kercher on the knife and Raffaele Sollecito on the bra clasp was formed at a later stage probably from the lab where the samples were kept and from the gloves that were used by the investigators[13]. The DNA traces of Raffaele Sollecito were present on the door handle of the room in which the body of Meredith Kercher was found. The same is not disputed as he did try to break open the door several times when there was no response from Meredith Kercher. The same door handle has been investigated by the investigators and it is probable that his DNA traces were transported to the bra clasp from the gloves used by the investigators. Similarly the DNA traces of Meredith Kercher on the knife might have been transferred from the lab where it was kept[14].

The fact that it is possible for the DNA samples to travel from one material to the other may seem like an unbelievable state of affairs. But the shocking truths revealed during the investigation process in the murder of Eleonora Knoernschild in US proves that it is quite easy for the DNA samples to travel from one material to the other thereby causing confusion and errors in the collection of evidence. The murder case was finally resolved after 30 years of murder with the help of DNA analysis but the outcome of the same has been severely criticized. The DNA

testing and the trial resulted in identifying two brothers, Brian McBenge and Cecil McBenge as the culprits. According to the prosecution, the former had dated the victim's granddaughter and was thus aware of the fact that the victim had money hidden in her home. The DNA samples of Brian McBenge were recovered from a cheese wrapper found in the victim's kitchen and that of Cecil McBenge from the victim's stocking. The said details were not refuted by the defence as these arguments were, in fact, supporting arguments so far as they were concerned. According to the defence counsels, the fact that Brian McBenge was in a relationship with the victim's granddaughter and the fact that he had visited the victim at her place and had occasionally had food explain the presence of his DNA samples. The defence did attempt to rebut the evidence found on the stockings by stating that it was never found on the crime scene but outside the victim's house. They also argued in their defence that the DNA samples were not properly stored and were contaminated by the police. But the important point raised by the defence was that the DNA samples could easily be transferred between materials and people and the fact that the two brothers lived together might have been the reason for Cecil McBenge's DNA presence in the analysis conducted[15].

The fact that the DNA traces of the DNA technician was also found on an item from the victim's house despite taking additional precautions in the form of two layers of gloves, a facemask and the fact that the evidence only touched surfaces that were covered with clean sheets of butcher paper, creates doubt on the veracity of DNA analysis in criminal investigations.[16]

Also notable here is the *David Butler trial* which ended in 2012. David Butler was a taxi driver, accused of murdering Annie Marie Foy, a local prostitute in Liverpool in 2005. He was arrested as his DNA was found in the fingernails of the deceased. Butler, who was a cab driver, had a rare skin condition and his dry skin made him shed skin flakes quite often. Since he was a taxi driver, his DNA could have transferred onto the deceased's fingernails when they exchanged money, or from another person who had made physical contact with Butler. He had to spend 8 months in remand before he was acquitted from the case.[17]

The cases of Jaidyn Leskie, Amanda Knox & Raffaele Sollecito, Eleonora Knoernschild, and the David Butler trial are clear indicators of the obscure flaws in the reliability of DNA evidence, and indicates the possibility wrongful convictions which could result out of overt reliance on DNA evidence. Apart from the accidental transfer of DNA, the use of partial matches too can mislead criminal investigations and result in grave miscarriage of justice. The next part of this paper attempts to briefly cover the issues associated with the use of partial matches in the course of criminal trial.

IV. Partial Matches: Could it Mislead the Criminal Investigation?

The entire human body is composed of cells, and DNA can be found to be present in every nucleated cell in the human body. It can be found even in the blood, semen, mucus, saliva, human excreta etc.[18] Almost 99 percent of the DNA is the same for all people, and the matching of DNA samples is done with the help of the remaining 1 percent.[19]DNA is very fragile, and very often the DNA obtained from crime scenes are contaminated easily. Such DNA samples would only help to provide a matching which is a "partial match". Even when a proper and uncontaminated sample of DNA is available, a match does not mean that the samples are identical; it only means that they are similar.So in cases where only partial matches are found, the reliability and admissibility of such DNA profiles as evidence should be given a reconsideration.

Professor Alec Jeffreys, the first person to apply DNA profiling in criminal investigation, revealed 20years after this that there is a high possibility for adventitious matches to occur if only a partial DNA profile is obtained from degraded samples.[20]

One of the cardinal principles of criminal justice administration system in India is that the guilt of the accused should be proved beyond reasonable doubt, and this principle should apply to the evidence that is submitted in the trial.[21] The evidence brought against the accused should have met with the standards of this principle. If one applies this principle in the case of a partial match obtained from degraded or contaminated DNA samples, it can be inferred that such matches should not be relied upon as there is the danger that the match could only be a coincidence. Besides, regardless of the amount of care taken by forensic experts, chances for human error should not be eliminated. Such errors, and reliance on partial profiles can very often mislead the criminal investigation.

V. Conclusion

A person can leave his or her DNA at a place even if he has never been there. It can be transferred even when one shakes hand with another, and DNA could be subsequently transferred to wherever he or she travels. According to Professor Allan Jamieson, Director of the Forensic Institute, Glasgow, Scotland, it is very much possible that a person could be wrongfully accused of being guilty merely because of human error or accident or even contamination.[22]

A fair trial and an impartial investigation process is inevitable in every criminal trial. The criminal investigation tools have, over the years, developed through trial and error methods. There have been instances where various scientific investigative tools were questioned for the health hazards that it may cause. One particular instance is that of Narco Analyis. But there was never a doubt that existed in the case of DNA testing. DNA testing, the most reliable and sophisticated tool in criminal investigations has now turned out to be the most vital tool in criminal investigations. Only a handful of people, even amongst the judiciary, are aware of such issues related to reliability of forensic evidence obtained from DNA. Irrespective of enough safety precautions, if the DNA samples are likely to be transferred between objects and persons, then it is time that its veracity is questioned.

Forensic Science has undoubtedly made a remarkable contribution to the field of criminal justice administration, but the excessive dependence on technology and science should not make one blind eyed to unreliability of such techniques. To conclude, it can be said that the infallibility of DNA is an erroneous perception.The authors of the paper are of the opinion that due safeguards should be adopted at the earliest so as to make DNA testing more reliable, admissible and helpful in criminal investigations or else the same would only be helpful so as to frame the innocent as guilty.

References

1 *Lan Francis is a 4thyear student at Bharata Mata School of Legal Studies, Cochin.

Sandeep Menon Nandakumar, BALLB (Hons) (NUALS), LLM (CUSAT), LLM (Exeter, UK), is presently a Research Scholar in NUALS, Cochin and Assistant Professor at Reva University, Bangalore.

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