

## Detection of Human Male DNA Profile from Non-Human Vaginal Mucous Swab: A Case Study of Bestiality

Rajesh Kumar<sup>1</sup>, Neha Gupta<sup>2</sup>, Nikita Sharma<sup>3</sup>, Kunwar Veer Vikram Srivastav<sup>4</sup>

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### Abstract

Bestiality or animal sexual abuse (ASA) is a type of unnatural sexual offense in which animals are used as a medium for satisfying sexual desire without developing any kind of emotional bonding. With the development of the DNA fingerprinting methods (restriction fragment length polymorphism), Dr. Alec Jeffreys provided the first molecular genetic tools to genetically differentiate between humans in the late 20th century, which initiated the replacement of protein-based methods in forensic testing and has revolutionized forensic investigations and it became a very important tool in criminal cases as well as civil cases. DNA profiling is golden technology in the investigation of rape cases as well as bestiality. In this case, a video had become viral in which a person was wearing a white shirt, he was having unnatural sex with a red color cow. During the police investigation, on the basis of viral video and thread, the police reached the suspect and the suspect accepted all his crimes in front of the police. The forensic samples (Vaginal swab of cow, underwear of suspect) and reference sample (blood sample of the suspect on FTA card) related to the case were received. Human semen was detected on the vaginal swab of the cow and the underwear of the suspect. After DNA examination, the same male DNA profile was obtained from the reference blood sample of the suspect and underwear of the suspect which is matching with the male DNA profile obtained from the source of the vaginal mucous swab of Cow.

**Keywords:** Bestiality; Unnatural sexual offense; Forensic DNA fingerprinting; FTA card.

### Introduction

Bestiality is a type of unnatural sexual offense in which animals are used as a medium for satisfying sexual desire without developing any kind of emotional bonding and it is also known as animal sexual abuse (ASA).<sup>1</sup> Section 377 of Indian Penal Code describes bestiality as Unnatural Offences. Sexologist Alfred Kinsey was one of the first individuals who studied on human-animal sexual acts.<sup>1</sup> According to 1940s survey of Alfred Kinsey in the individuals of United States regarding their

sexual behavior, 8% of all males reported a history of sexual activity with animals, and nearly half of boys growing up on a farm reporting at least one episode of sexual activity with an animal and 1.5% of female respondents had sex with an animal before adolescence and 3.6% had sex with an animal after adolescence.<sup>2,3</sup> According to Aggrawal, bestiality is classified into ten classes from I to X respectively.<sup>1,4</sup>

With the development of the DNA fingerprinting methods (restriction fragment length polymorphism), Dr. Alec Jeffreys provided the first

**Author's Affiliation:** <sup>1</sup>Assistant Director, DNA Division, <sup>3</sup>Junior Scientific Assistant, <sup>2</sup>Assistant Professor, Guru Ghasidas University, Bilaspur, Chhattisgarh 495009, India, <sup>4</sup>Forensic Scientific Assistant, DNA Division, State Forensic Science Laboratory, Rajasthan, Jaipur 302016, India.

**Correspondence:** Kunwar Veer Vikram Srivastav, Forensic Scientific Assistant, DNA Division, State Forensic Science Laboratory, Rajasthan, Jaipur 302016, India.

**E-mail:** kunwarsrivastav678@gmail.com

molecular genetic tools to genetically differentiate between humans in the late 20th century, which initiated the replacement of protein based methods in forensic testing and has revolutionized forensic investigations and it became a very important tool in criminal cases as well as civil cases.<sup>5,6</sup> The discovery of short tandem repeats (STRs or microsatellites), also known as simple repeat sequences were boon for forensic investigation.<sup>7</sup> Forensic DNA fingerprinting or profiling is golden technology in the investigation of rape cases as well as bestiality.

In this study, we present a case of identification of bestiality using autosomal STR markers. In this case, a video had become viral in which a person was wearing a white shirt, he was having unnatural sex with a red color cow. The disgusting work had done by the person was immoral and it harmed the religious belief of the society. The crime scene had no CCTV camera and there was no eyewitness and there was a lack of evidence that's by whom the video was made. During the police investigation, on the basis of viral video and thread, the police reached the suspect and the suspect accepted all his crimes in front of the police. Therefore, investigating officer (IO) sent forensic samples and a reference sample of the suspect for the DNA test at State Forensic Science Laboratory, Jaipur, Rajasthan 302016, India.

## Material and methods

The forensic samples (Vaginal swab of cow, underwear of suspect) and reference sample (blood sample of the suspect on FTA card) related to the case were received properly sealed condition with the sample to maintain the integrity and chain of custody of samples at the DNA Fingerprinting division, State Forensic Science Laboratory, Jaipur, Rajasthan for routine casework analysis. Samples were collected forwarded according to the guidelines of the laboratory. Blood sample of the suspect was collected after obtaining written informed consent and as per the declaration of Helsinki<sup>8</sup> and following the laboratory guidelines. DNA was extracted from forensic samples by Auto Mate Express TM (Applied Biosystems), a Prep Filer TM Express Forensic DNA extraction kit (Applied Biosystems) along with a control sample of the accused. To prepare the lysis solution, 500 IL of Prep Filer TM lysis buffer was mixed with freshly prepared 5 IL of 1 M DTT (Dithiothreitol), and 500 IL of the mixture was added to the samples in a Prep Filer TM Ly Sep TM column. Lysis of the samples was performed

at 70°C for 40 min, according to the user manual.<sup>9,10</sup> The blood sample of the suspect on the FTA card was directly subjected to amplification.<sup>11</sup> The quantity and quality of isolated DNA from forensic samples were evaluated using Quantifiler™ Trio DNA quantification kit (Thermo Fisher Scientific, CA, USA Thermo) on QuantStudio™ 5 Real Time PCR System (Thermo Fisher Scientific, CA, USA-Thermo) as per recommendations of the manufacturer.

Amplification of the 24 STRs locus which included 22 CODIS (D3S1358, D1S1656, D2S441, D10S1248, D13S317, PENTA-E, D16S539, D18S51, D2S1338, CSF1PO, PENTA-D, TH01, vWA, D21S11, D7S820, D5S818, TPOX, D8S1179, D12S391, D19S433, FGA, D22S1045) and two gender determining loci AMELOGENIN and DYS 391) was performed using PowerPlex® Fusion 5C system kit (Promega) by Verti™ Thermal Cycler (Thermo Fisher Scientific, CA, USA Thermo) as per recommendations of manufacturer except for half reaction volume.<sup>12</sup>

For the separation and detection of amplified STR markers, Capillary Electrophoresis took place on an ABI 3500XL Genetic Analyzer (Thermo Fisher Scientific, CA, USA) using POP 4 polymer which is a separation matrix for performing fragment analysis and DNA sequencing applications, and 36 cm capillary array. For the capillary electrophoresis, we followed the recommendations of the manufacturer using 1 µL of the PCR product and allelic ladder (AL) into 10 µL of a mixture consisting in 0.5 µL of Gene Scan 600 LIZ Size Standard v.2.0 (Thermo Fisher Scientific, CA, USA) and 9.5 µL of Hi Di Formamide (Thermo Fisher Scientific, CA, USA). The obtained raw data were analyzed using the Gene Mapper ID-X v 1.6 software (Thermo Fisher Scientific, CA, USA). The analytical threshold for STR was 100 RFU.

## Result and discussion

The allelic description of DNA profile obtained from the reference blood sample of the suspect, underwear of suspect, and vaginal mucous swab of Cow are depicted in table 2. The analysis of electropherogram obtained from geneMapper ID-X (Version 1.6) software showed that the gender determining (Amelogenin and DYS391) and 22 CODIS (D3S1358, D1S1656, D2S441, D10S1248, D13S317, PENTA-E, D16S539, D18S51, D2S1338, CSF1PO, PENTA-D, TH01, vWA, D21S11, D7S820, D5S818, TPOX, D8S1179, D12S391, D19S433, FGA, D22S1045) are amplified in the reference as well as forensic samples. The male DNA profile obtained

from the reference blood sample of the suspect and underwear of the suspect is matching with the male DNA profile obtained from the source of the vaginal mucous swab of Cow. In other words, alleles obtained from the reference sample of the suspect are shown the match on all the alleles of

the source of the vaginal mucous swab of Cow. The male DNA profiles obtained from the reference blood sample of the suspect, underwear of the suspect, and the source of the vaginal mucous swab of Cow showed single homozygous allele at D10S1248.

**Table 1:** Aggrawal's 2011 classification of bestiality.

Class	Name	Description of sex act
Class I	Role player	Has sex with a human who pretends to be an animal
Class II	Romantic zoophile	Keeps an animal as a pet for sexual stimulation, but does not engage in sexual activity with animals
Class III	Zoophilic fantasizer	Fantasizes about intercourse with animals and may masturbate in the presence of an animal. Does not have intercourse with the animal
Class IV	Tactile zoophile	Strokes erotic parts of an animal or rubs genitals against an animal
Class V	Fetishistic zoophile	Uses parts of animals like furs as a fetishistic object
Class VI	Sadistic bestial	Obtains sexual gratification from sadistic behavior toward an animal
Class VII	Opportunistic zoophile	Has sex with animals when consenting humans are unavailable
Class VIII	Regular zoophile	Has sex with humans when animals are unavailable
Class IX	Homicidal zoophile	Prefers sex with dead animals over living animals
Class X	Exclusive zoophile	Exclusively has sex with animals

**Table 2:** Genetic profile obtained by 24 STR markers (Power Plex® Fusion 5C system kit).

Locus	DNA Profile obtained from Reference Blood sample of Suspect	DNA Profile obtained from Underwear of Suspect	DNA Profile obtained from Vaginal mucous swab of Cow
Amelogenin	X,Y	X,Y	X,Y
D3S1358	16, 17	16, 17	16, 17
D1S1656	14,16	14,16	14,16
D2S441	11,15	11,15	11,15
D10S1248	13, 13	13, 13	13, 13
D13S317	8,12	8,12	8,12
PENTA-E	7,12	7,12	7,12
D16S539	9,12	9,12	9,12
D18S51	13, 14	13, 14	13, 14
D2S1338	19,20	19,20	19,20
CSF1PO	11, 12	11, 12	11, 12
PENTA-D	9, 11	9, 11	9, 11
TH01	9,9,3	9,9,3	9,9,3
vWA	15,16	15,16	15,16
D21S11	29,33.2	29,33.2	29,33.2
D7S820	10, 11	10, 11	10, 11
D5S818	12, 13	12, 13	12, 13
TPOX	8, 9	8, 9	8, 9
DYS391	10	10	10
D8S1179	12, 14	12, 14	12, 14
D12S391	17,19	17,19	17,19
D19S433	12, 13	12, 13	12, 13
FGA	21, 23	21, 23	21, 23
D22S1045	11, 12	11, 12	11, 12

## Conclusion

On the basis of DNA analysis and the principle of exchange, it is concluded beyond doubt that the source of the male DNA profile obtained from the reference blood sample of the suspect is matching with the male DNA profile obtained from the source of the vaginal mucous swab of Cow.

## *Compliance with ethical standards*

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## *Disclosure of conflict of interest*

Authors declared that they have no conflict of interest.

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