



Identification of sexual assault cases by using RSID kit and STR of suspects and victim in some cases in Iraqi population

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ABSTRACT

In the Current study case, the methods for forensic identification of semen was using the Rapid Stain Identification (RSID-Semen). We demonstrate that RSID-Semen is accurate, reproducible, and highly sensitive for human fluid. The sensitivity of RSID allows investigators to sample a fraction of a questioned stain while retaining the majority for DNA-STR analysis. We demonstrate that RSID identifies Semen from the clothes of victim and from suspects .RSID is a useful forensic test for determining which evidentiary items contain target sample and thus may yield a DNA profile by using power plex21 for the FTA of victim and suspect A ,B ,C comparison of DNA finger print for all profiles to make match between them .

Keywords: *STR, Power plex21 , RSID*

INTRODUCTION

The use of RSID and STR in forensic to solve the sexual assault cases is highly powerful method in order to comparison the DNA profile of victim and more than one suspect in assaults criminal cases ,[1,2,3] this technique depends on detection of semen in criminal highlights and then matching the loci of DNA profile with other DNA profile to solve cases . As in this study , in some cases there are multiple or mixture of STRs belong to more than three persons, the use of RSID (Rapid Stain Identification Kit) kit is very helpful to solve this type of cases .

RSID can help to detect human fluid like blood ,urine, semen and saliva[4,5,6].

MATERIAL AND METHODS

Samples

After take permission to use the FTA blood samples in DNA Profiling test and subsequent studies. Criminal evidence includes FTA Blood samples of three suspects male whom symbolized in this study (A , B and C) , one victim female symbolized as (D) and underwear of victim D symbolized as (E) , were prepared to study the STR profile .

RSID Semen Kit

The confirmatory test for human seminal fluid , is designed for fast, easy, and reliable detection, [7,8]RSID™-Semen Field Kit results correlate with the ability to obtain DNA profile data. The procedure was performed according to manufacture instructions .[9,10,11]Detection of the clothes victim by pretest to ensure of the seminal fluid on the clothes .

After applying RISD kit , we locate the spot that contain semen , then cut apart from these spots by sterile blade[12,13] .

DNA extraction and Electrophoresis

Extraction of DNA applied by maxwell machine reach pure extract DNA in eppendorf PCR then done to amplified the specimen and get rid of inhibitors .Electrophoresis applied by 3130 xl genetic analyzer to systematic the specimen to numerical data and through software programs include gene scan and gene typer[14,15,16] , the data analyzed and total program wich is gene

mapper proceeded the DNA finger print of semen in the clothes of victim[17,18].

STR Profiling

Genomic DNA was obtain direct from PCR by punching the FTA .The kit used is the study was power plex 21 Promega ,done according manufacture's instructions)[7,8] .Gene AMP PCR system 9700 Applied Biosystems was used for amplification As follows:

Five µl of mixed primer pair was added to 15 µl D.W. and amplification grade, then 5 µl of master mix 5X was added.

Control DNA samples of suspects A,B,C and DNA sample of victim D , under wear E . The total volume 12 µl for each processed sample. After vortexed the amplicon , loading in PCR system 9700 (Instruction of use found in power Plex 21 system Technical Manual+Tmd031). www.promega.com/Protocols

Then we performed post PCR and then ABI 3130 XL Genetic analyzer as mentioned in table 1 were used .

TABLE 1: the mixture of Genetic analyzer reaction

WEN internal lane stander 500	0.5 µl
Formamide	9.5 µl
DNA Samples	2.0 µl
Positive Control	1 µl
Negative Control	1 µl

According to procedure we denatured sample for 5 min , then shocked in ice for five min. using the polymer 4, D.D.W. and buffer , samples loaded in plate of Genetic Analyzer. Setting the analyzer as for the standardization of PowerPlex Criteria,(standard Labs). We used the software of gene mapper ID V3.2(applied Biosystems) for STR profiling.

Statical analysis

The DNA profile index was calculated in

standard using the frequency of alleles from the population genetic data for 20 autosomal STR loci in IRAQI ARAB population. Application to identification of human beans.

RESULT AND DISCUSSIONS

The following DNA profile were obtained (as in table 1) from using power plex 21 STR kit , then matching the profiles and comparison between them.

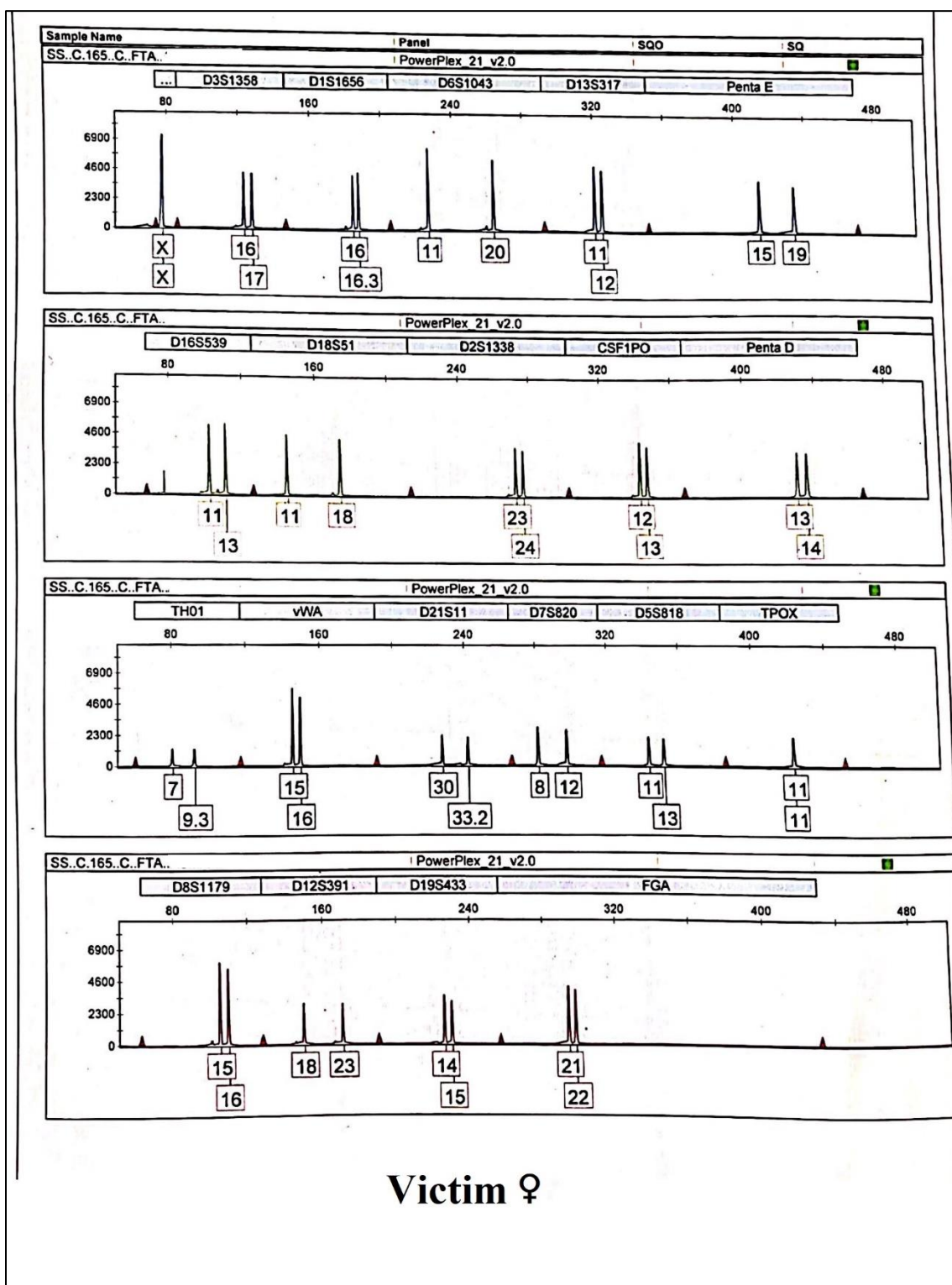


FIGURE 1: Genotype of victim allele

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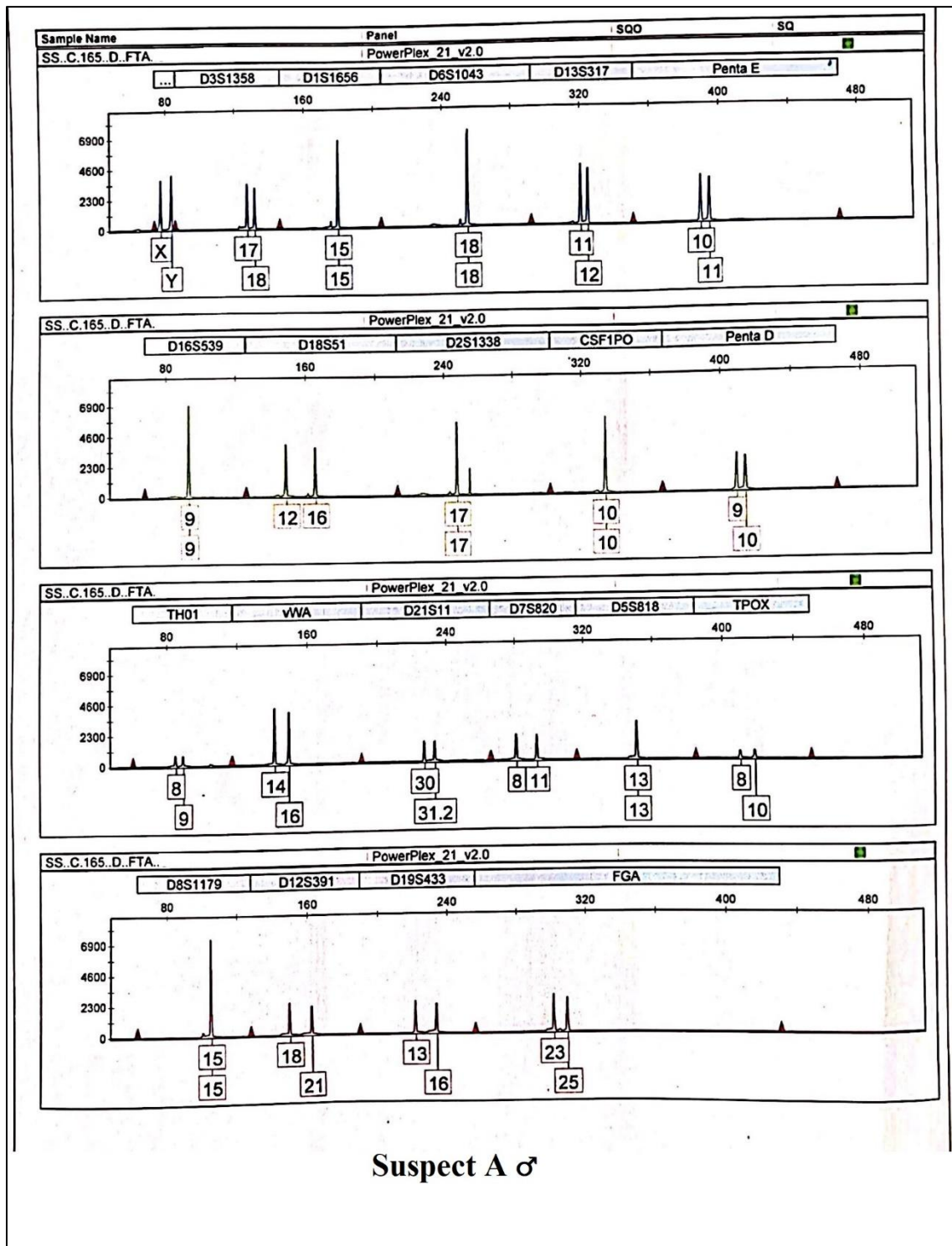


FIGURE 2: Genotype of suspect A allele

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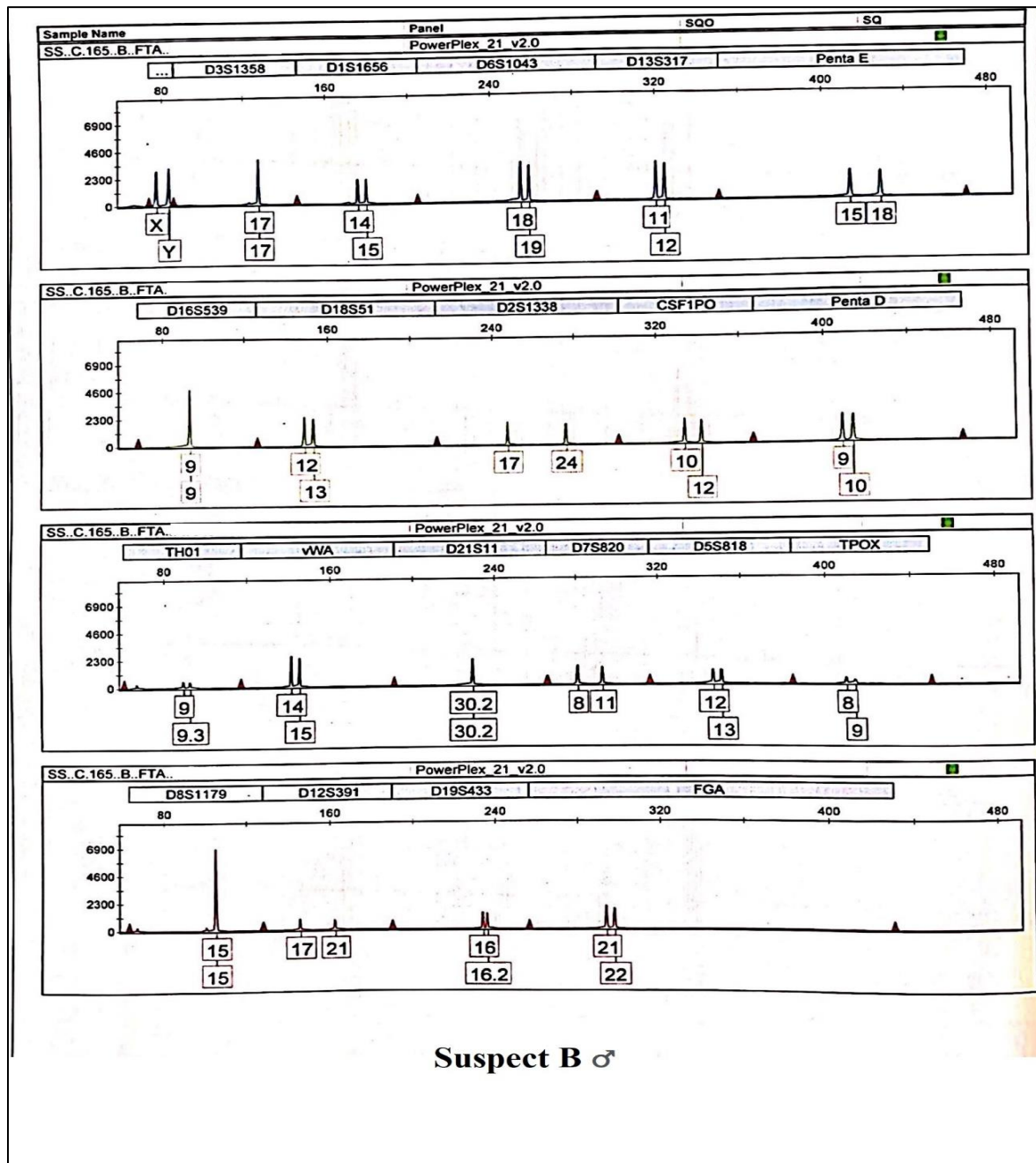


FIGURE 3: Genotype of suspect B allele

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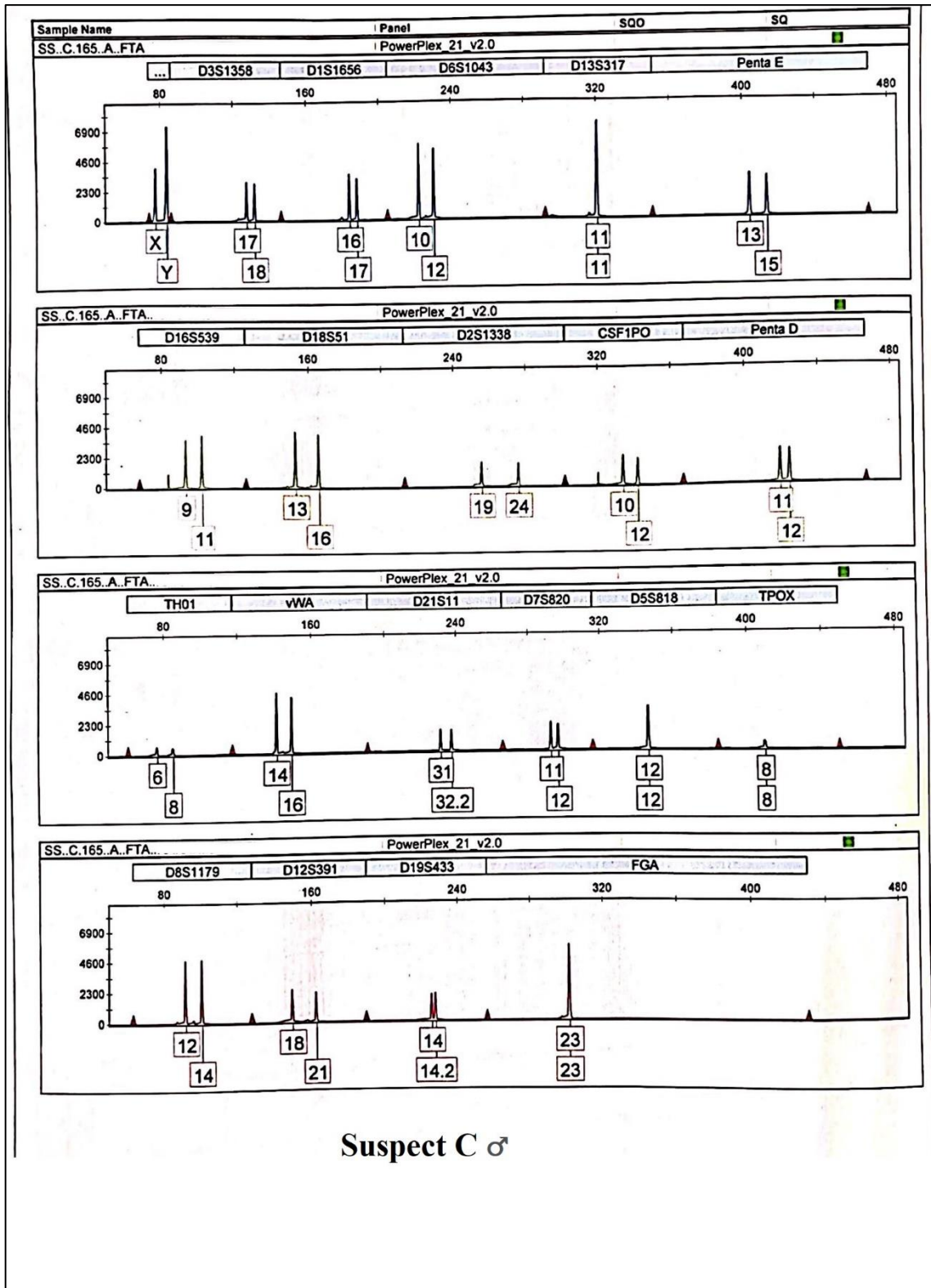


FIGURE 4: Genotype of suspect C allele

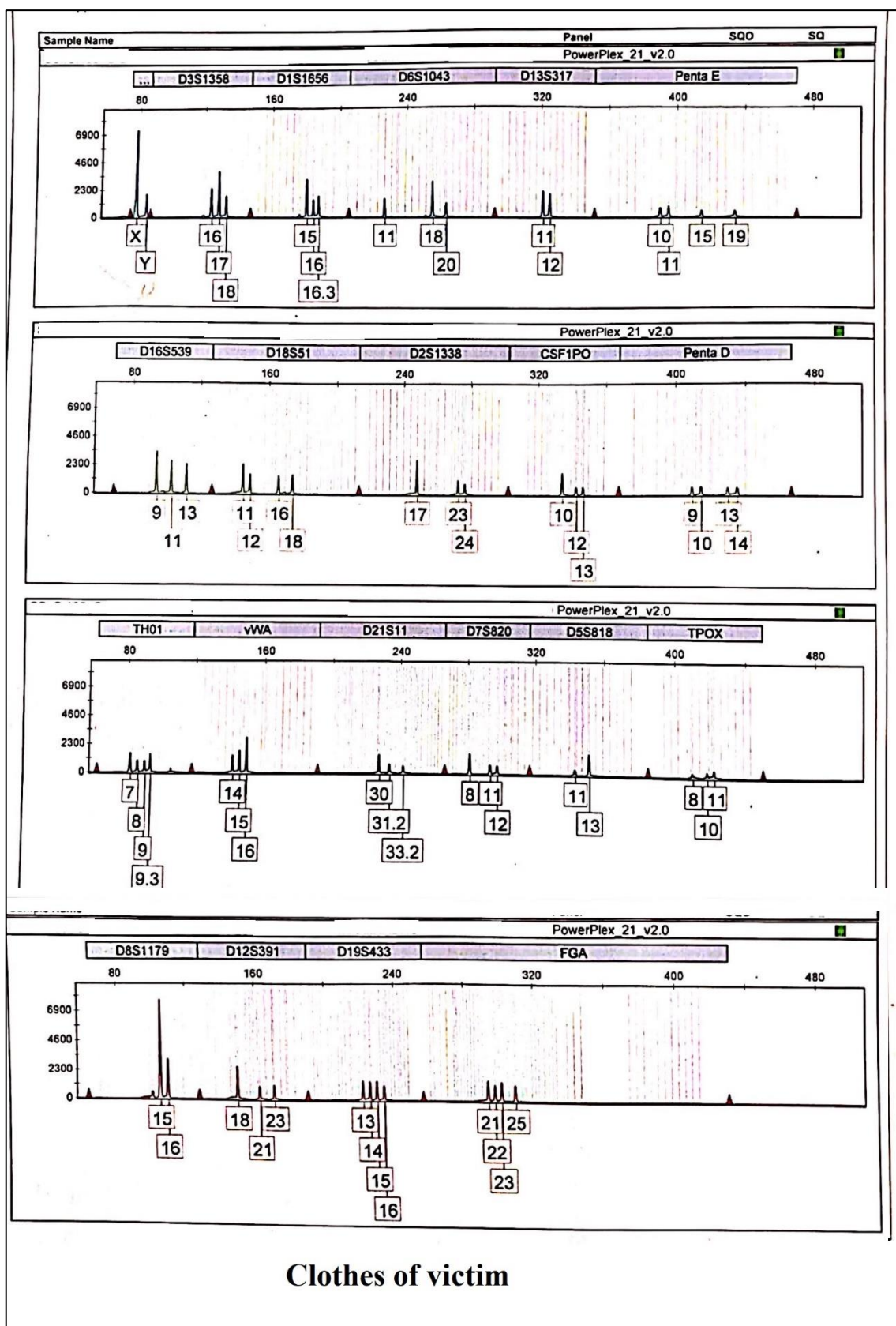


FIGURE 5: Genotype of victim clothes allele

TABLE 2: The genotypes of Suspect A, Suspect B , Suspect C , Victim and victim underwear clothes , PowerPlex 21 STR KIT (Promega)

STRs	Suspect A ♂	Suspect B ♂	Suspect C ♂	Victim ♀	Clothes of victim
amylogenic	X,Y	X,Y	X,Y	X,X	X,X,X,Y
D3S1358	17,18	17,17	17,18	16,17	16,17,17,18
D1S1656	15,15	14,15	16,17	16,16.3	15,16,16.3
D6S1043	18,18	18,19	10,12	11,20	11,18,20
D13S317	11,12	11,12	11,11	11,12	11,12,11,12
Penta E	10,11	15,18	13,15	15,19	10,11,15,19
D16S39	9,9	9,9	9,11	11,13	9,11,13
D18S51	12,16	12,13	13,16	11,18	11,12,16,18
D2S1338	17,17	17,24	19,24	23,24	12,17,23,24
CSF1PO	10,10	10,12	10,12	12,13	10,12,13
Penta D	9,10	9,10	11,12	13,14	9,10,13,14
TH01	8,9	9,9.3	6,8	7,9.3	7,8,9,9.3
vWA	14,16	14,15	14,16	15,16	14,15,16,16
D21S11	30,31.2	30.2,30.2	31,32.2	30,33.2	30,30,31.2,33.2
D7S820	8,11	8,11	11,12	8,12	8,8,11,12
D5S818	13,13	12,13	12,12	11,13	11,13,13
TPOX	8,10	8,9	8,8	11,11	8,10,11
D8S1179	15,15	15,15	12,14	15,16	15,15,16
D12S391	18,21	17,21	18,21	18,23	18,21,23
D19S433	13,16	16,16.2	14,14.2	14,15	13,14,15,16
FGA	23,25	21,22	23,23	21,22	21,22,23,25

After analysis was done by power plex 21 for the FTA of victim and suspect A ,B ,C comparison of DNA finger print for all profiles to make match between them . Mismatch the profile of victim clothes with profile of suspect B,C and proved the match between clothes of the victim with the profiles of suspect A .

We proved that in gene marker software , the DNA of suspect A approved found in the clothes of victim , so the match approved ,While the profile of victim clothes is mismatch with suspects B,C .We conclude the asexual assult is done by the suspect A .

CONCLUSIONS

STR considered as very good tool to identification and matching the DNA profiles and solve criminal cases .

The use of RSID kit can help to detection multiple profile and diagnose it .

the alleles detection is valuable in making decision for criminal cases.

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