

Beetle Crime Scene DNA Analysis

A despicable crime has been committed in the second floor lounge of the Biology Building at around 9:00 P.M. The insect display case in the lounge has been vandalized, and the rare Egyptian scarab beetle is missing, but its identification tag is left, and is found covered in a saliva-type mucus. A near-sighted custodian on his way out of the building noticed several people celebrating the night before in the lounge. He thinks both males and females were among the individuals present. Three people have admitted to being in the Biology Building at the time the crime took place. None claim to have spent time in the lounge celebrating or to have committed the crime. The custodian's wife who was waiting for her husband outside, and who sees clearly has positively identified all three as entering the building. Soda cans, cigarette butts, sunflower seeds, chewing gum, a contact lens, an apple core, and a recent issue of the magazine, *Incredible Edible Insects*, have been found at the scene of the crime.

Evidence Report

Laboratory Case Number: CSI007

Offense: Theft

Victim: Rare Scarab Beetle

Suspect (s): A, B, C, D

Evidence Submitted:

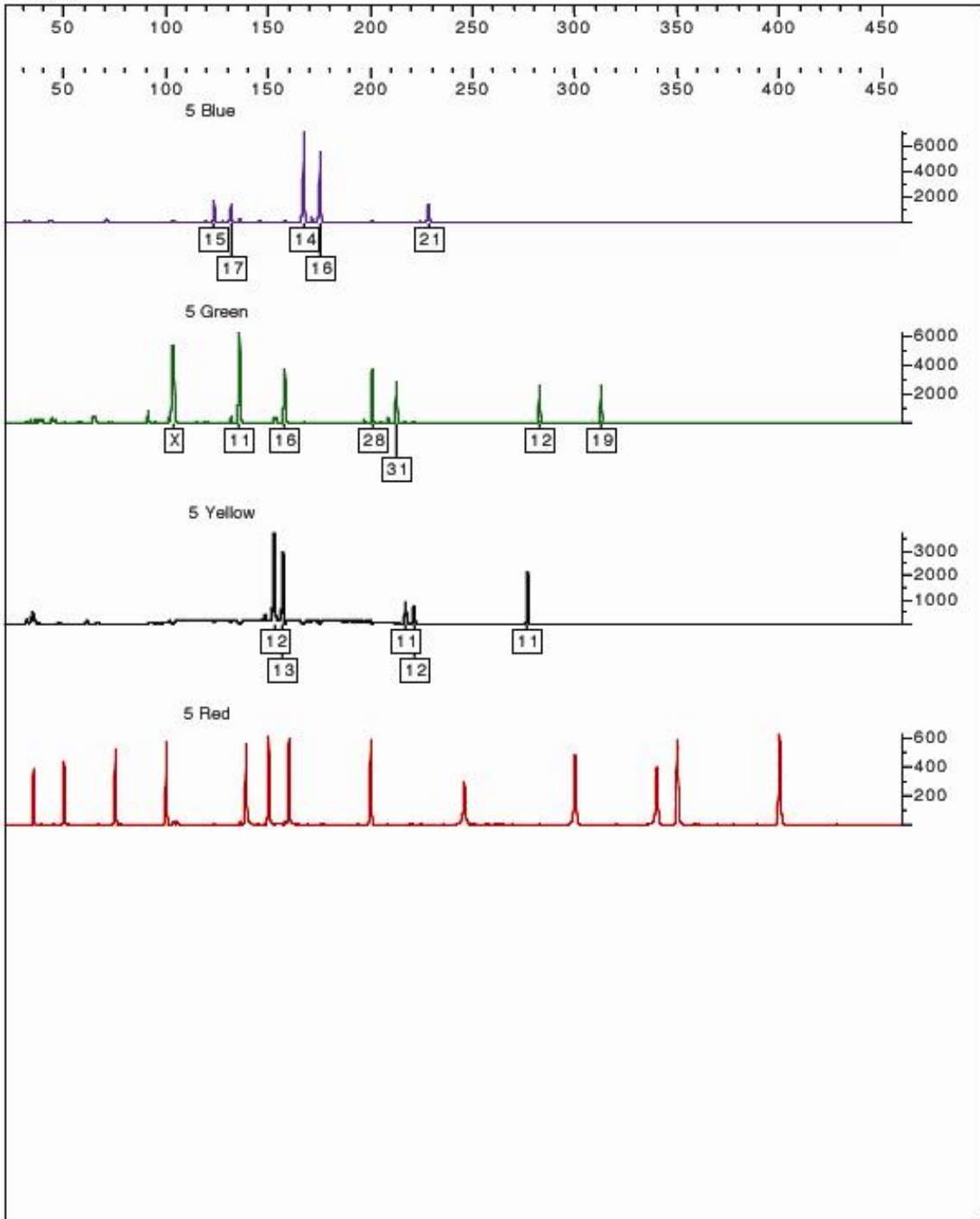
- stain from beetle ID tag (Crime Scene DNA)
- buccal swab from Suspect A
- buccal swab from Suspect B
- buccal swab from Suspect C
- buccal swab from Suspect D

Requested Analysis:

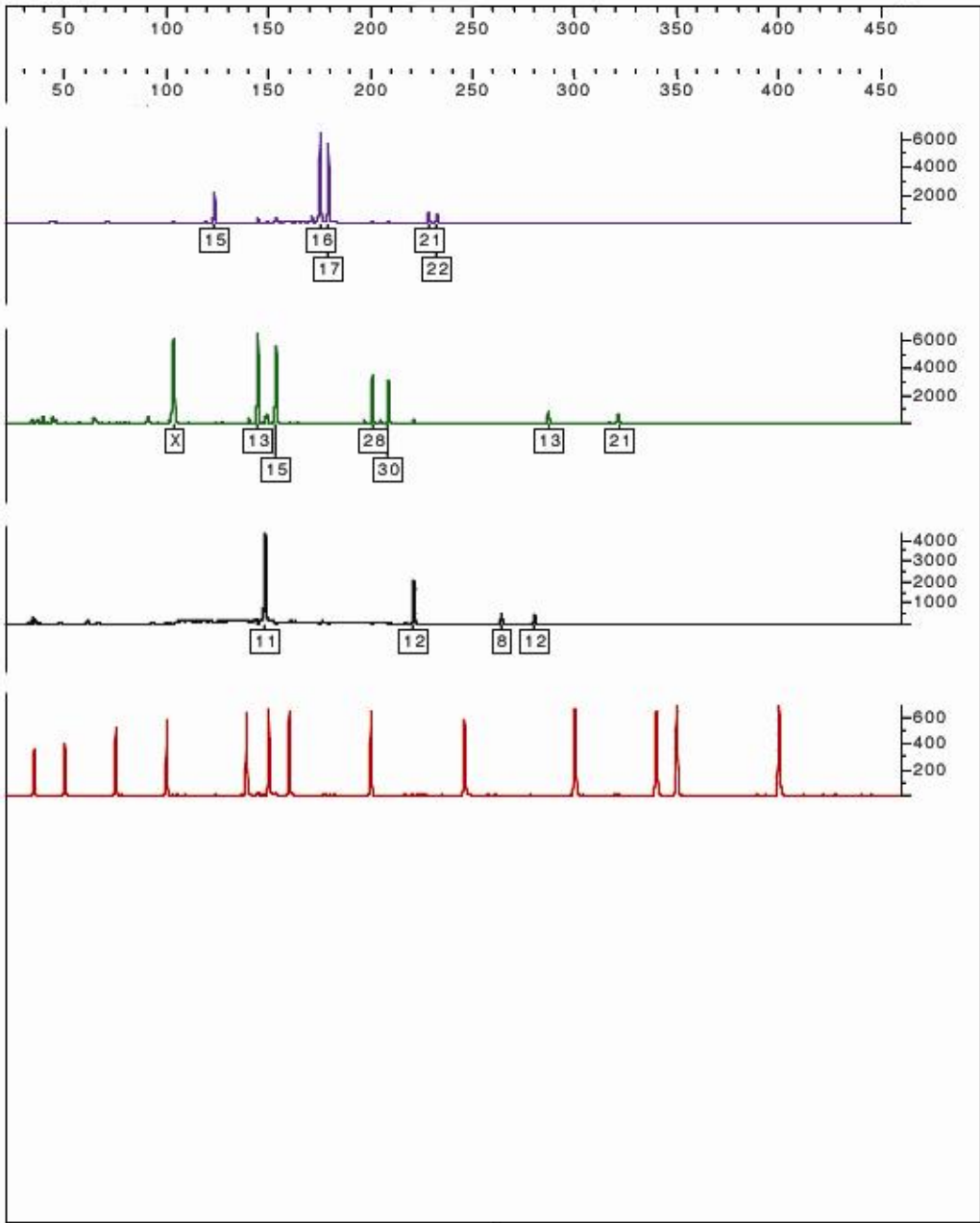
Perform STR DNA analysis on the evidence items submitted.

Results of Analysis:

DNA was extracted from the stain found on the beetle ID tag and from the four suspects. PCR and STR analysis was performed using the AmpFLSTR® ProfilerPlus Kit and protocol. The following genotypes were obtained:

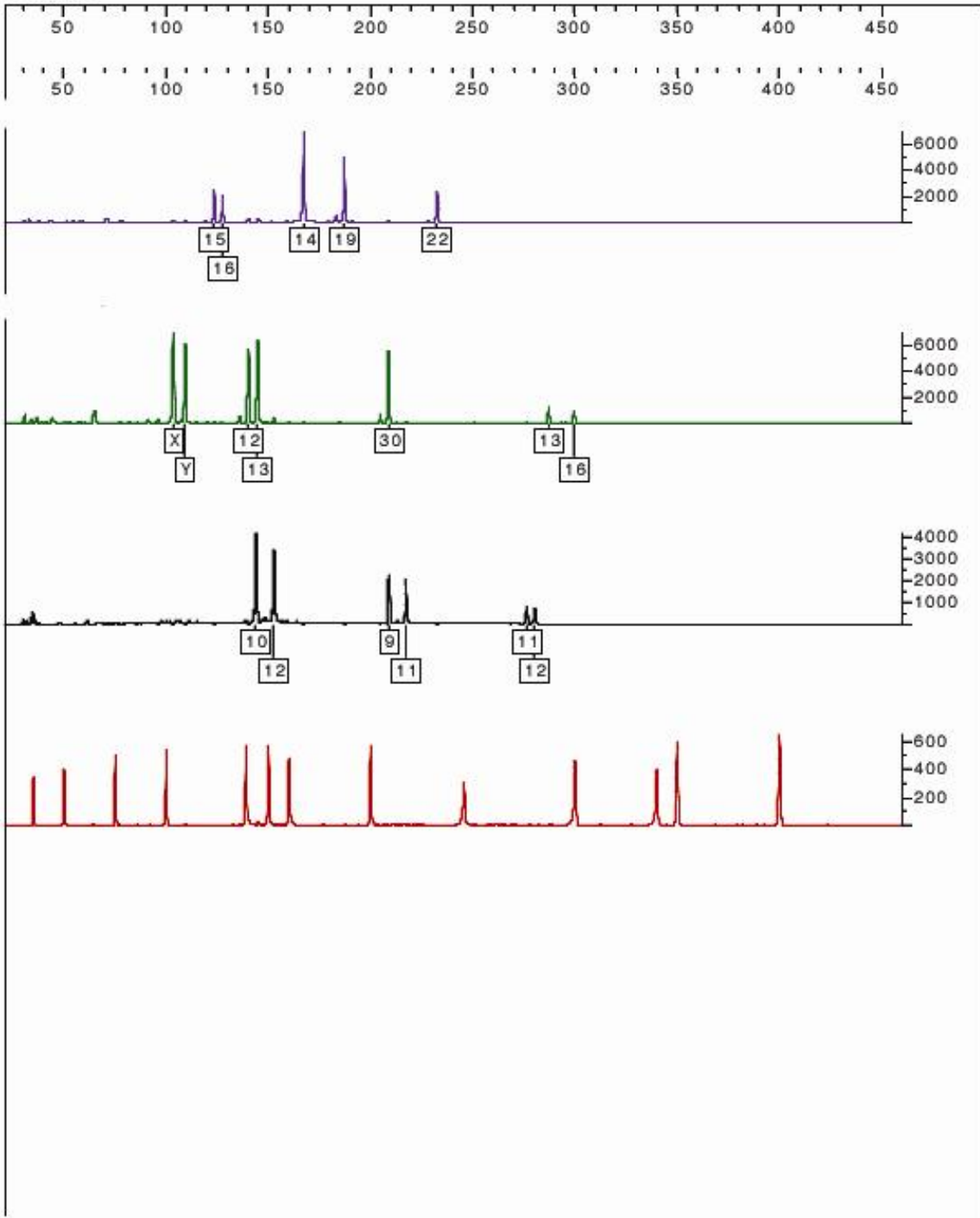


Crime Scene

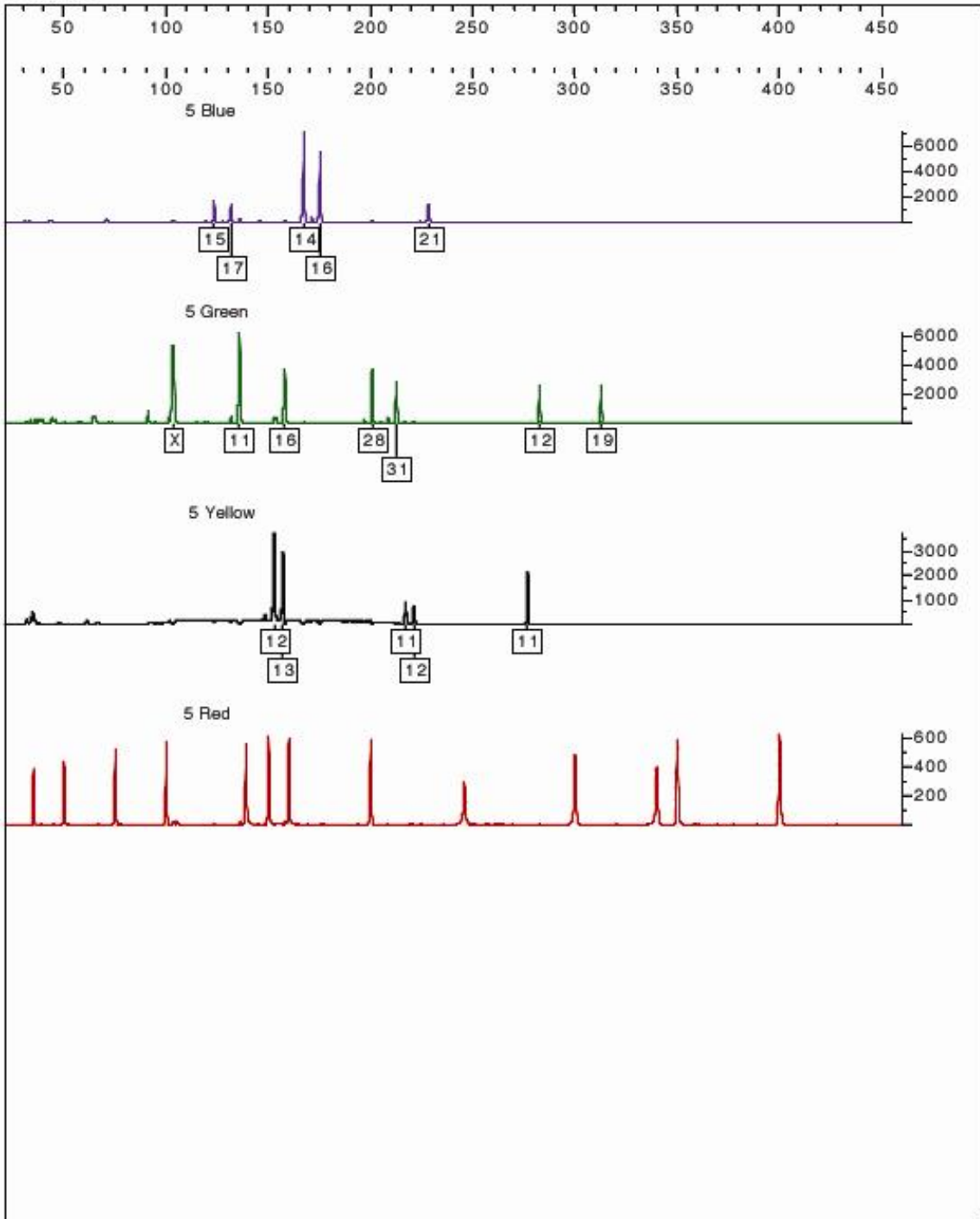


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Suspect A

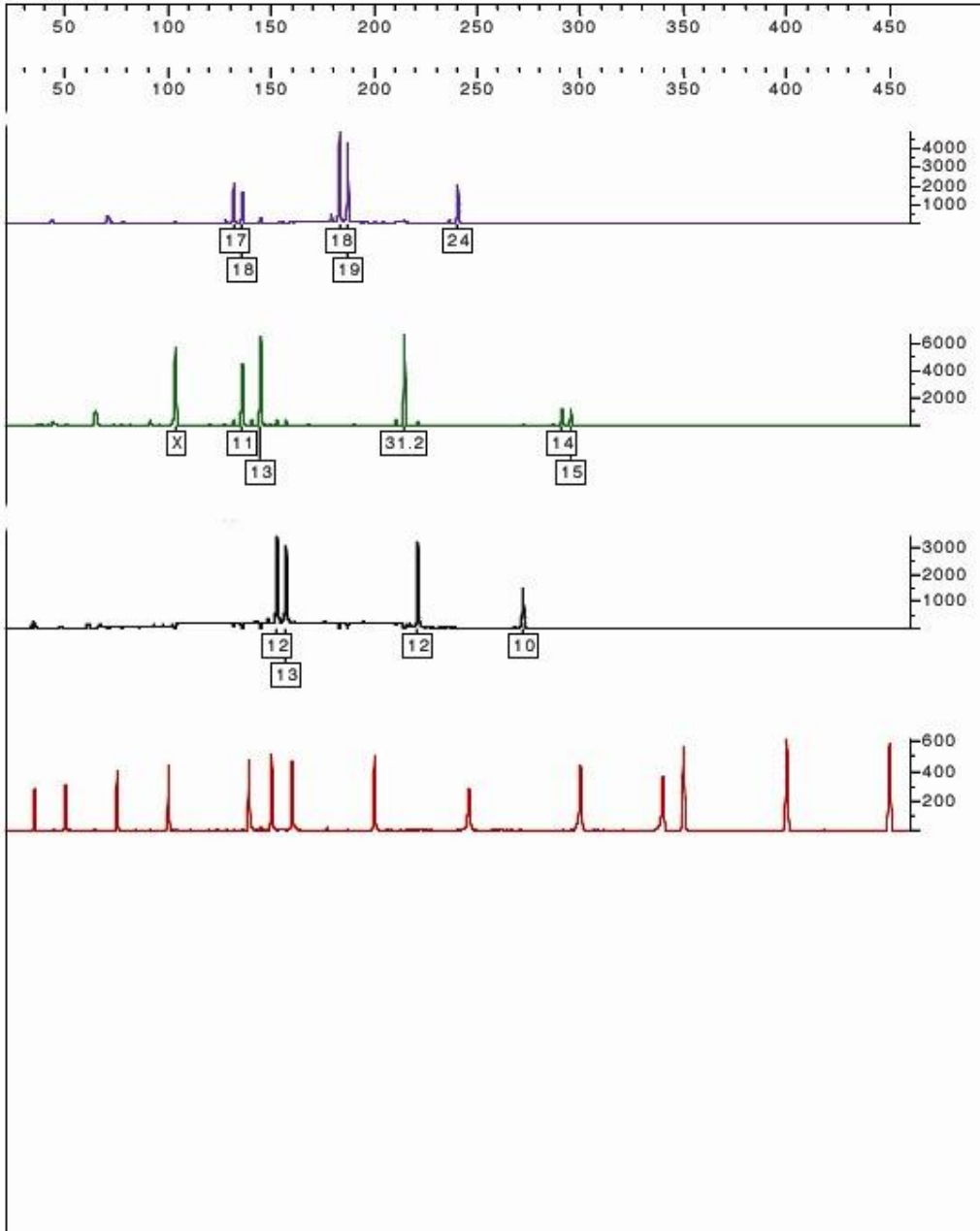


Suspect B



Suspect C

ABI
PRISM



Suspect D

Genotyping Data Table for Beetle DNA Analysis Activity

Use the five electropherograms above to record the genotypes of each individual. Write in the sample name. Indicate the gender (F/M), and genotype (G) as either heterozygous (Hh) or homozygous (HH) for each sample. Show the number of STR repeats (# R) at that locus. An example is shown for you.

AmpF/STR® Profiler Plus® STR Loci With Fluorescent Label

		D3S1358 Blue Gene		vWA Blue Gene		FGA Blue Gene		D8S1179 Green Gene		D21S11 Green Gene		D18S51 Green Gene		D5S818 Yellow Gene		D13S317 Yellow Gene		D7S820 Yellow Gene	
ID	F/M	G	#R	G	#R	G	#R	G	#R	G	#R	G	#R	G	#R	G	#R	G	#R
CSI 007	F	Hh	14 16	HH	18	Hh	19 25	Hh	8 9	Hh	30, 31	Hh	9 10	Hh	11 12	Hh	9 10	HH	10

Analysis

Use the information you recorded in the Genotyping Data Table above to complete the following:

The DNA results from the Crime Scene, and Suspects A, B, C, and D are consistent with:

- being contributed by the same individual
- being contributed by different individuals

The DNA extracted from Suspect A

- is consistent with the profile obtained from the stain on the beetle ID tag
- is not consistent with the profile obtained from the stain on the ID tag

The DNA extracted from Suspect B

- is consistent with the profile obtained from the stain on the beetle ID tag
- is not consistent with the profile obtained from the stain on the ID tag

The DNA extracted from Suspect C

- is consistent with the profile obtained from the stain on the beetle ID tag
- is not consistent with the profile obtained from the stain on the ID tag

The DNA extracted from Suspect D

- is consistent with the profile obtained from the stain on the beetle ID tag
- is not consistent with the profile obtained from the stain on the ID tag

Conclusion

Can you establish the identity of the DNA recovered from the crime scene?
_____ (yes, no)

How can you do this?

How can this information be used to link a suspect to a crime scene?