NON-SPECIFIC AMPLIFICATION IN CASEWORK SAMPLES USING POWERPLEX® FUSION AMPLIFICATION KIT

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With the advancement in technology, a wider variety of DNA evidence is being submitted for testing. In cases where DNA is contaminated with non-human species such as cats, chickens, bacteria, etc., extra alleles or off-ladder (OL) alleles are observed. These extra alleles often become questionable in DNA mixture interpretation. This poster highlights some of these non-specific amplifications observed in our casework samples.

In one specific case, a vehicle was stolen and the suspect left a partially eaten chicken wing in the car. The chicken wing was submitted for DNA testing in hopes of developing a profile from any saliva left on the wing. Two swabs were collected from the overall surface of the chicken wing. The swabs were extracted using DNA IQ™ for Maxwell® 16. The sample was amplified using PowerPlex® Fusion. A full DNA profile was developed with three minor off-ladder peaks. Two of the off-ladder alleles were observed in the JOE channel at 217 and 218 bases at the genetic locus D2S1338. The third off-ladder allele was observed in the TMR-ET channel at 296 bases at the genetic locus D7S820. The two alleles in the JOE channel are consistent with peaks observed in chicken DNA and were marked as non-specific alleles.

In another case, DNA swabs were collected from a bag of suspected drugs. Off-ladder alleles were observed in the fluorescein channel at 139 bases at the genetic locus D3S1358 and at 214 and 218 bases at the genetic locus D2S441. Off-ladder alleles were also observed in the JOE channel at 84 and 85 bases at the genetic locus D16S539 and at 218 and 219 bases at the genetic locus D2S1338.

The data from these samples were sent to Promega and these extra alleles were determined to be non-specific amplifications. When interpreting DNA mixtures with extra alleles, it is necessary to take extra precaution before ruling out the possibility of non-specific amplification.