

Abstract

Project Code : TRG5780131

Project Title : Simultaneous identification of authentic ivory and its source
by the SNaPshot direct-multiplex assay

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Project Period : June 2014-May 2016

Abstract:

Illegal trading of ivory is mainly responsible for the dramatic decline in elephant population. To help combat ivory poaching and smuggling, a competent method for elephant species identification from ivory and its product is therefore needed, as trading or possessing Asian elephant ivory is legal in some country while trading or possessing African elephant ivory is illegal. In this study, a SNaPshot® and mini-SNaPshot® multiplex assay were developed and fully validated. Elephantid and elephant specific-mitochondrial SNPs were identified from 207 mammalian and 1,409 elephant cyt b sequence alignments. Ten and seven informative SNPs were successfully used in a SNaPshot® and a mini-SNaPshot® assay, respectively. The assays unambiguously and accurately identified authentic elephant ivory and its species on the basis of peak size and color (haplotype profile). Both assays were highly reproducible; showed high success rate for blood, confiscated ivory and its products; exhibited no cross-reaction with other 27 mammalian DNA; and had 100% identification accuracy. The mini-SNaPshot® was highly sensitive and able to analyze low-template ivory product with 90.9% success rate. In addition, nested and direct amplification were also compatible with the developed assay.

Keywords: SNaPshot multiplex, ivory, ivory product, elephant species, identification