Full Length Research Paper

DNA species surveillance: Monitoring bushmeat poaching and trading in Kenya using partial cytochrome b gene

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DNA species identification has applications in such areas as forensic science, systematics, conservation genetics and agriculture. One key anthropogenic activity threatening large wildlife fauna is illegal exploitation. In Kenya, species identification of raw and processed meat products remains a constraint to effective enforcement of illegal trade in game meat (bushmeat) and products. We tested the reliability of a 321 bp mitochondrial cytochrome b (cyt b) region as a species identification tool for application in wildlife forensics. Query sequences were generated from known specimens of 14 Eastern African wildlife species, 13 representing commonly poached ungulates, and three domesticated species. These were compared, using Basic Local Alignment Search Tool (BLAST) algorithm, with NCBI GenBank reference sequences for species identity. These query sequences were subsequently deposited on Genbank. They represent a contribution to a diagnostic internal East African Wildlife reference cyt b database. The test species comprised: Cape buffalo, bushbuck, Guenther's dik-dik, common duiker, common eland, Grant's gazelle, hartebeest, impala, lesser kudu, plains zebra, Thomson's gazelle, common warthog, wildebeest, Maasai ostrich, cattle, goat and sheep. Additionally, cooked beef and pork samples were analyzed. The results show that, when conspecific sequences were available in the database, species discrimination was 100%. Phylogeny clustering of the species by maximum likelihood supported the species determination by BLAST. The second part of the study carried out a preliminary survey of the prevalence of illegal game meat sold in the dispersal area of Tsavo National Park, Kenya. Sixty two raw meat samples were randomly collected from small roadside retail outlets along the Nairobi-Mombasa highway (A109), a major transnational highway that transverses Tsavo National Park. The results indicate a 9.7% (n = 6) illegal game meat sale, comprising five Guenther's dik-diks and a Beisa oryx. A 2 km radius hotspot, with 83% (n = 5) of the bushmeat sales was identified just south of Tsavo East National Park.

Key words: East Africa, Kenya, bushmeat, poaching, wildlife conservation, species identification, mitochondrial cytochrome b gene.