**Conserving Thai Elephants: Insights from Ivory-Related Genetic Markers**

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**Abstract:** Asian elephants (*Elephas maximus*) hold immense cultural and economic significance in Thailand as a national symbol. They are a keystone species, shaping the land and supporting the ecosystem, playing a vital role in maintaining biodiversity. Habitat loss and the severe poaching of their ivory have led to a critical threat for elephants in the realm of conservation biology. Artificial selection imposed by selective poaching of male elephants with long ivory tusks, leading the elephants to evolve without tusks and, consequently, resulting in a loss of genetic diversity. In this study, blood samples were collected from 60 captive elephants, consisting of 20 males with short ivory tusks, 20 males with long ivory tusks, and 20 females. Genome-wide SNP DArtseq analysis was conducted to identify genetic markers associated with ivory traits. The candidate loci will be mapped to a reference genome constructed using hybrid assemblies of high-coverage Illumina sequencing, long-read PacBio, long-read Oxford Nanopore sequencing, and Hi-C. Furthermore, these ivory-related genetic markers offer the potential to accelerate complete genome sequencing efforts and may provide valuable insights into the linkage with the sex chromosome. Findings from this study will aid in both in situ and ex situ conservation management and breeding strategies. Understanding their diversity related to ivory will inform a conservation action plan and drive genomic research innovations. These results will bolster sustainable tourism and conservation efforts, elevating Thailand as a global center for elephant research.

**Keywords:** Asian elephants; conservation biology; ivory-related genetic markers; genome sequencing; elephant diversity

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