

## Genetic Assessment of The Managed Gharial Population In The Girwa River, India

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**Abstract :** Human-induced factors contributed to the population decline of crocodylians in India which became evident by the mid-20th century when authorities forewarned the extinction risk for the crocodile and proposed regulation in the crocodile trade. The proposed action led to the enactment of national and international wildlife regulations to prohibit the trade-in of crocodile skins and parts. Subsequently, conservation translocation programs were initiated to restore the species in the wild through a 'head-start' approach. In India, the crocodile conservation program, which began in the early 1970s, has been one of India's longest-running conservation initiatives. The gharial (*Gavialis gangeticus*) population has benefitted, and the gharial number increased rapidly owing to these efforts. The immediate risk of extinction was averted as the gharial has recovered due to decades-long cumulative conservation efforts, the consideration of the genetic for monitoring the recovery of the recovered populations is still lacking. Hence, we assessed the genetic diversity of the Girwa gharial population in India using six polymorphic nuclear microsatellites loci and mitochondrial control region. The number of alleles per loci ranged between 2 to 5, and the allelic richness ( $A_r$ ) was  $2.67 \pm 0.49$ , and the observed ( $H_o$ ) and expected ( $H_e$ ) heterozygosities were  $0.42 \pm 0.08$  and  $0.42 \pm 0.09$ , respectively. The  $M$ -ratio yielded a value of  $(0.41 \pm 0.16)$  lower than critical  $M$ , suggesting a genetic bottleneck in the Girwa population. We observed more mitochondrial control region haplotypes in the Girwa population than previously reported in the largest gharial population in the Chambal River. Overall, our study indicates that genetic diversity remains low despite the recovery in the Girwa population. Hence, we recommend a range-wide genetic assessment of gharial populations using high-throughput techniques to identify the source population and plan future translocation programs.

**Keywords :** conservation translocation, recovery, crocodile, bottleneck

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