



### **G51 DNA Sequencing for Identification of *Funambulus* Species With Possible Forensic Implication for Conservation of *Ratufa Indica Elphinstoni***

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After attending this presentation, attendees will be aware how poaching cases of endangered species are handled in India.

This presentation will impact the forensic science community by increasing knowledge on wildlife DNA for forensic work.

Wildlife forensics is a relatively new field of forensic science. Wildlife forensic scientists must be prepared to identify evidence from any species in the world that is illegally killed, smuggled, poached, or sold illicitly. Despite the frequency of poaching, the perpetrators are seldom charged with breaking the law; even more rarely are such individuals caught in the act of transgression. The modern advent of molecular DNA forensics now adds a new dimension to wildlife law enforcement and may, eventually, also serve as an added deterrent. Molecular data is sometimes the only type of information available to conservation officials in their field investigations. The latest DNA-based technologies today make it feasible to identify single individuals by DNA typing from only trace amounts of their genetic material. The application of DNA technologies in wildlife forensics demands not only that gender and individual profiling be determined, but that the target animal species be also identified correctly.

The Indian giant squirrel, *Ratufa indica*, is a large-bodied diurnal, arboreal, and herbivorous squirrel found in South Asia commonly known as "Shekru" (*Ratufa indica elphinstoni*). It is the state animal of Maharashtra. It inhabits in the deciduous or mixed forests and is abundant in the forests of the Western Ghats of Maharashtra. The animal is protected in Bhimashankar Wildlife Sanctuary. *Ratufa indica elphinstoni* is a conservation priority for the State of Maharashtra in India. It is imperative to secure *Ratufa indica elphinstoni* populations in all the areas they currently occupy, whilst encouraging expansion into some of their former range. The identification of the species becomes an essential part in forensic work in cases involving Wildlife Protection Act (1972) cases.

DNA sequencing allows unequivocal identification of species in forensic cases. Molecular techniques such as DNA barcoding are gaining importance in recent years to resolve these questions. Here in this study, we have checked the utility of DNA barcoding for species identification of *Funambulus* and *Ratufa indica elphinstoni* using mitochondrial genes Cytochrome Oxidase I (COI) and two ribosomal genes (12S and 16S). This analysis successfully discriminated both the species.

When identification of species is essential in forensic wildlife cases, the above technique can be used unequivocally for identification of these species.

The use of animal DNA evidence in forensic investigations is a new and emerging field. In particular, the modern DNA-based molecular methods will aid in the fight against the poaching of endangered and protected species, and in the prevention of cruelty to animals. The illegal culling, collecting, and trading of animals (and animal products) can now be revealed more effectively, and a link between the victim and the suspect established with a far greater degree of confidence. The continued development of a standardized set of protocols for wildlife forensics will further enhance the capacity of law enforcement officials to protect and conserve animals in the wild.

**Species, DNA, Forensic**