

## Molecular Diversity of Forensically Relevant Insects from the Cadavers of Lahore

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**Abstract :** Molecular diversity is the variation in the abundance of species. Forensic entomology is a neglected field in Pakistan. Insects collected from the crime scene should be handled by forensic entomologists who are currently virtually non-existent in Pakistan. Correct identification of insect specimen along with knowledge of their biodiversity can aid in solving many problems related to complicated forensic cases. Inadequate morphological identification and insufficient thermal biological studies limit the entomological utility in Forensic Medicine. Recently molecular identification of entomological evidence has gained attention globally. DNA barcoding is the latest and established method for species identification. Only proper identification can provide a precise estimation of postmortem intervals. Arthropods are known to be the first tourists scavenging on decomposing dead matter. The objective of the proposed study was to identify species by molecular techniques and analyze their phylogenetic importance with barcoded necrophagous insect species of early succession on human cadavers. Based upon this identification, the study outcomes will be the utilization of established DNA bar codes to identify carrion feeding insect species for concordant estimation of post mortem interval. A molecular identification method involving sequencing of a 658bp 'barcode' fragment of the mitochondrial cytochrome oxidase subunit 1 (CO1) gene from collected specimens of unknown dipteran species from cadavers of Lahore was evaluated. Nucleotide sequence divergences were calculated using MEGA 7 and Arlequin, and a neighbor-joining phylogenetic tree was generated. Three species were identified, *Chrysomya megacephala*, *Chrysomya saffrana*, and *Chrysomya rufifacies* with low genetic diversity. The fixation index was 0.83992 that suggests a need for further studies to identify and classify forensically relevant insects in Pakistan. There is an exigency demand for further research especially when immature forms of arthropods are recovered from the crime scene.

**Keywords :** molecular diversity, DNA barcoding, species identification, forensically relevant

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