INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Programme of Study	:	Ph.D.

Thesis Title: Evolutionary landscape of dipteran insects

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Insects are the most successful animals on the planet, in terms of both ecological and evolutionary success. Diptera are typical insect order having two wings and accounts for one-tenth of all living creatures on the earth. Their ability to feed on a variety of foods has allowed them to thrive in a wide range of food chains and climatic niches. Our knowledge of the evolution of flies is muddled by limited and contradictory morphological and genomic data, as well as the difficulty of capturing the huge species diversity in a single complete phylogenetic analysis.

On the basis of various issues related to Diptera phylogenetics, adaptability and diversification events the entire PhD research has been composed of five objectives. The first of which was to sequence and characterize the mitochondrial genome of

Blepharipa sp., a dipteran endoparasite of the Muga silkworm, in order to better understand the genomic foundation of this species' unusual parasitism strategies. The second objective addresses various issues that arise during phylogenetic reconstruction with larger taxon sets using mitochondrial DNA. The third objective is to use genomic orthologous genes to construct a Diptera phylogeny and estimate divergence time. The fourth objective is to categorizing Diptera based on their dietary habits and correlate them with nucleotide substitution rates in mitochondrial protein coding genes, as well as to associate macroevolutionary studies lineages with different diets. The final objective of the thesis is to investigate divergence time using mitochondrial protein coding genes and diversification dynamics, including the role of various biotic and abiotic factors in Diptera evolution.