



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI  
SHORT ABSTRACT OF THESIS

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Thesis Title:

Floral Diversity and Genome Size Estimation of Flowering Plants from IIT Guwahati – Plastome Mining of Selected Small Genome Sized Plants

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SHORT ABSTRACT

Flowering plants exhibit remarkable diversity with high endemism in Northeastern (NE) India. This study explored the floral diversity and estimated genome sizes (GS) of selected species at the Indian Institute of Technology (IIT) Guwahati campus. A survey identified 434 species from 101 flowering plant families, including 172 herbs, 98 shrubs, 82 trees, 56 aquatic plants, and 26 climbers. These species were categorized as medicinal (296 spp.), ornamental (47 spp.), exotic (178 spp.), and native (256 spp.). GS of 110 species were estimated using flow cytometry, with 58 new estimates. These estimations provide insights into genetic characteristics and evolutionary trajectories. Five small genome-sized ( $\leq 2$  pg) plants were selected for high-throughput sequencing to obtain and annotate complete plastomes. Comparative analysis of tandem repeats, simple sequence repeats (SSRs), nucleotide diversity ( $P_i$ ), nucleotide substitution rates (Ka/Ks ratio), and synonymous codon usage bias was conducted. The results provide valuable resources for future research on floral biology, conservation, and evolutionary biology of flowering plants in the region. Additionally, the plastome sequences can be used for phylogenetic analyses, comparative genomics, and functional genomics investigations.