

## **DO NATIVE PLANTS DEPLOY MORE RAPIDLY EVOLVING GENES THAN THEIR CULTIVATED RELATIVES DO?**

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### ABSTRACT

Due to conserved nucleotide sequences, nuclear ribosomal DNA and chloroplast ribulose biphosphate carboxylase large subunit (rbcL) DNA sequences are commonly used in phylogenetic analysis of various plant species. In contrast, resistance genes (R-genes) are highly variable within plant genomes that diversify in response to rapidly evolving pathogens. In this study, we compared the mutation rates of nuclear Internal Transcribed Spacer (ITS), chloroplast rbcL, and R-gene sequences from 21 native grass species and ten crop species. Native grasses showed a higher mutation rate among R-gene sequences compared to that in crop species, with all 31 species retaining more conserved ITS and RBCL sequences. Multiple amplicon sequences were found in native grasses, which we infer to be the result of expansions in the R-gene family that were not seen in crop species. Our data support the hypothesis that the genes in native grass species diversify faster than in crop species, although the genome of both native and crop species contain both fast and slow evolving genes.