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Colchicum autumnale genome mining for colchicine pathway genes

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Colchicum autumnale is the most well-known plant for colchicine accumulation. Colchicine also binds with tubulin and blocks mitosis by inhibiting polymerization. This mechanism has been used in anticancer drug development. The current understanding of colchicine biosynthesis is based on radiolabelling studies and transformation of O-methylandrocybmine to demecolcine with microsomes prepared from immature seeds of *C. autumnale*. However, the colchicine pathway genes are not yet identified. To elevate colchicine production for drug formulation, the metabolic engineering of the colchicine pathway is necessary. To screen colchicine biosynthetic pathway genes, we analyzed the publically available *C. autumnale* RNA-Seq database. Our initial bioinformatic analysis revealed that annotation of 59315 assembled multi-tissues transcript sequences represents 20454 unique genes with homologs in known plant-specific Gene Ontology (GO) slims. This RNA-seq could provide the predicted colchicine pathway genes and transcripts.

Biography

Biography Sivakumar's research is primarily focused on biotech implications and applications of high-value natural products. He has extensively studied the plant-based small molecules pathway biochemistry, synthetic biology and metabolic & bioprocess engineering. He is internationally recognized in the field of biopharmaceuticals and a pioneer in industrial-scale production of bioactive molecules. He has over 40 publications. He is also on the editorial board of several journals. He serves as an expert of grant proposals as well as numerous scientific journals. His laboratory focuses on metabolic and bioprocess engineering of colchicine pathway and developing potential anticancer medicine. In addition, his group is interested in developing biofuels to address energy and environmental problems

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