Exploring the medicinally important secondary metabolites in fenugreek through transcriptome studies

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Abstract

Fenugreek (Trigonella foenum-graecum L.) is a self-pollinated leguminous crop belonging to the Fabaceae family. It is a multipurpose crop used as herb, spice, vegetable and forage. It is a traditional medicinal plant in India attributed with several nutritional and medicinal properties including antidiabetic and anticancer. We have performed a combined transcriptome assembly from RNA sequencing data derived from leaf, stem and root tissues. Around 2,09,831 transcripts were deciphered from the assembly of 92% completeness and an N50 of 1382 bases. Whilst secondary metabolites of medicinal value, such as trigonelline, diosgenin, 4-hydroxyisoleucine and quercetin, are distributed in several tissues, we report transcripts that bear sequence signatures of enzymes involved in the biosynthesis of such metabolites and are highly expressed in leaves, stem and roots. One of the antidiabetic alkaloid, trigonelline and its biosynthesising enzyme, is highly abundant in leaves. These findings are of immense value to nutritional and the pharmaceutical industry.