Expression of Caffeine Biosynthesis Genes in Tea (*Camellia sinensis*)

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Using semi-quantitative reverse transcription-PCR, we studied the expression of genes encoding caffeine synthase (*TCS1*), inosine-5′-monophosphate dehydrogenase (*TIDH*), *S*-adenosyl-L-methionine synthase (*sAMS*), phenylalanine ammonia-lyase (*PAL*) and α-tubulin (*Tua1*) in young and mature leaves, stems and roots of 4-month-old tea seedlings and young and old tea tissue cultures. The amounts of transcripts of *TCS1* were much higher in young leaves than in other parts of the plant. Expression of *TIDH* was greater in leaves than in other parts. Little difference in the amounts of transcripts of *PAL*, *sAMS* and *Tua1* was found between various organs of tea seedlings. Larger amounts of transcripts of *TCS1* and *PAL* were found in young callus tissues than in old tissues. These results support our conclusion deriving from previous enzymatic and metabolic studies that caffeine is synthesized mainly in young leaf tissues. We propose that marked caffeine biosynthesis in young leaves is dependent on a greater expression of the *TCS1* gene in the organ.

Key words: Caffeine Biosynthesis, Gene Expression, *Camellia sinensis*