

Nucleotide sequence of a tomato mitochondrial tRNA^{Cys} (GCA) gene

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A total tomato DNA library in EMBL3 (1) was screened with the end labeled tomato 4S RNAs to provide a clone TR4 carrying a 12.5 kb insert, which was hybridized to the mitochondrial(mt) genome but not the nuclear and chloroplast (cp) genomes. In the insert of TR4 a 558 bp HindIII/EcoRI fragment hybridized to the probe was subcloned into M13 mp18/19 for sequence analysis. DNA sequence revealed that a single tRNA gene was identified and it contains the anticodon GCA corresponding to a cysteine codon. The 3' CCA is not encoded in the gene. This tomato mit tRNA^{Cys} gene shows 66 and 59% sequence homologies with E. coli (2) and tobacco cp (3) genes, respectively. So far, a plant mit tRNA^{Cys}(GCA) gene has been found in maize, which shows a nearly complete homology with maize cp counterpart (4) but only 56% homology with this tomato gene. The transcript from the tomato mit tRNA^{Cys} gene has been detected by Northern analysis (5). This is therefore the first reported sequence of a functional cysteine tRNA gene unique to the plant mit genome.

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AAGCTTTTGGAAACCTAGTTTGGAGTTTTCCCAACCAACCTATACCTTACTAATAAAAAGGGGCTTCCCTTTTTCAG 80
CTGCATTGCACTGCCGATAAACAATGGATCCGCTGGGCTGGATGAGCAACCTTCTATCTGGCCCTGTACCAATAGTAG 160
AGTGGCTTGCTACTTTCAATCAGAAAAGGAAGATTGAGCAAGGCAAAGGAGAAAGGAGTTGTCCCCCTTCTCTGGTAAC 240

                                tRNA Cys →
CCGCCGCCGATATGTAGAAAAAGAAGGAGCGGAGAAGGAAGAACAACCGTTTTACTTTGGCACATGAGGTGGCGGGTTT 320
GCTAGGTAACATAATGGAAATGTATCGGACTGCAAATCCTGGAATGACGGTTCGACCCCGTCTTGGCCCTCGAGGAGTGG 400
TGAGCAGCACGGAACCTGTTTCAATCAAATGGCATAGTATTAGGGTAGGAGGCTTTCCCTTTGTTATAGAAATCCACAGAC 480
AAGATTCTGGAACCTCCAAACCAAGAAATGCAAGATGAGAAGGAGCTTTTTACGTTACGCTTCAATAGAATGAATTC 558

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