

Comparison of tRNA^{Trp} and tRNA^{Pro} gene sequences in the chloroplast and mitochondrial genomes of *Oenothera*

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The only product that has been shown to be synthesized from a chloroplast derived sequence in mitochondria is the tRNA^{Trp} in wheat and maize (1). This plastid region including the upstream tRNA^{Pro} gene and the spacer between the two genes is also present in the mitochondrial genome of the dicot *Oenothera*. Comparison of the respective plastid (pt) and mitochondrial (mt) sequences shows a four nucleotide deletion in the mitochondrial tRNA^{Pro} coding region destroying proper folding of the deduced tRNA structure in the anticodon stem-loop structure. The mitochondrial tRNA^{Trp} sequence however could encode a functional tRNA identical in sequence with the plastid tRNA^{Trp} in *Oenothera*. The spacer between the two genes has been conserved in size but not in its primary sequence between the plastid and the monocot and dicot mitochondrial sequences. The strong similarity between the plastid and mitochondrial tRNA^{Pro} regions suggests some evolutionary constraints on this sequence in the mitochondrial genome.

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tRNA Pro -
pt  CAATTTGGAAAAGGGATGTAGCCGACCTTGGTAGCCGCTTTCTTTTGGGTACAAAATGTCACGGGTTCAAATCCTGTCAATCCCTA CCTA
    ** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
mt  CAA--TGGAAAAGGGATGTAGCCGACCTTGGTAGCCGCTTTCTTTTGGG---AAATTTACCGGGTTCCAATCCTTTTCACTCCCTA CCTA

pt  TTACTTCTCCTCTGAGCAGTAACGATTG-----AAATGATTCAAAT---CATG---CGAATCGTTTTTGTAGCTAGGTATATA
    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
mt  AACCTTCTCCTCTGGGCCGTAATGACGGTTCATTGAGATCGATTCAAATAGGACATAAAAAAGAATC-----TA

pt  TAAGATATGTATGCTATATGATAGCATAACAAGGTTATTGGGATTACAAAACAAAAGACTCGTCTTACATACAGCCTTAGCTATTGGG
    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
mt  TAATGTTTGATACTATATG-----CAAGA---CTGGG--TA-----AAAAGAATCCAACGCTAACCAGTCTATCTACTGTGA

tRNA Trp -
pt  ATTAGAAAACGCTCTTAGTTCAGTTCGGTAGAACCGGGTCTCCAAAACCCGATGTCGTAGGTTCAAATCCTACAGAGCGTGATT
    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
mt  GTT-GAAAACGCTCTTAGTTCAGTTCGGTAGAACCGGGTCTCCAAAACCCGATGTCGTAGGTTCAAATCCTACAGAGCGTGATT
    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
    
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Reference

1. Maréchal, L. et al. (1987) *Curr.Genet.* 12, 91-98.