

Bombyx mori Thioredoxin: cDNA Cloning and Up-regulation
in Response to Paraquat, H₂O₂, Microorganism or
Temperature Stress

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A thioredoxin gene was cloned from the silkworm, *Bombyx mori*. The *B. mori* thioredoxin cDNA contains an open reading frame of 318 bp encoding for 106 amino acid residues and possesses one cysteine residue that is characteristic of 1-Cys subgroup of thioredoxin family. The deduced amino acid sequence of the *B. mori* thioredoxin cDNA was closest in structure to *Manduca sexta* thioredoxin-like protein (89% protein sequence identity). Northern blot analysis revealed the presence of *B. mori* thioredoxin transcripts in all tissues examined. When paraquat (methyl viologen), H₂O₂ or microorganisms (*Escherchia coli*, *Beauveria bassiana* or *B. mori nucleopolyhedrovirus*) were injected into the body cavity of *B. mori* larvae, thioredoxin mRNA expression was up-regulated in the fat body. In addition, the expression levels of *B. mori* thioredoxin mRNA in the fat body significantly increased when *B. mori* larvae were exposed at low (4°C) or high (37°C) temperatures, which suggests that the *B. mori* thioredoxin possibly protects against oxidative stress caused by extreme temperatures and microorganism infection.