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In response to heat and other stresses plants synthesize various kinds of low molecular weight heat-shock proteins (LMW HSPs) ranging from 15 to 30 kDa. We isolated a full length cDNA clone, TLHS1, from tobacco which encodes a class I LMW HSP of 159 amino acids. Genomic DNA blot hybridization for the TLHS1 showed that TLHS1 was encoded by a multigene family on the nuclear genome. More than 8 members of class I LMW HSPs were identified from genomic library screening and sequence analyses. These genomic clones, A5, A7, B3, B4, H1, H2, I4, and J2, for the class I LMW HSPs showed different expression patterns upon heat-shock and developmental stage of tobacco. Under the heat-shock conditions of 40°C and 44°C, transcripts for A5 and A7 were weakly detected. H1 showed a similar expression pattern, but the signal was stronger compare to A5 and A7. Transcripts for these genes were detected at 30 min of heat-shock, and the level increased until 1 h. H2 also showed a typical heat-shock response. Transcript level of H2 increased until 2 h. Interestingly, A5 and A7 expressed in the pollen under non heat-shock condition. From these result, we suggest that expression of class I LMW HSPs could be controlled by heat and/or other signals. In this report we will show the gene structures and expression patterns for the class I LMW HSPs in tobacco.

Keywords: LMW heat shock protein, sequence comparison, expression pattern, genomic blot analysis