Genetics and Molecular Research

Cloning and expression analysis of cysteine protease gene (*MwCP*) in *Agropyron mongolicum* Keng

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ABSTRACT. In this study, a cysteine protease gene (*MwCP*) from *Agropyron mongolicum* Keng was isolated using RACE. Sequence analysis indicated that *MwCP* was 1473 bp, and it contained a 1134-bp open reading frame, which encoded 377 amino acids with a 24-amino acid N-terminal signal peptide. The results indicated that the MwCP protein was a new member of the papain C1A family, and it was predicted to be an extracellular, secretory stable hydrophilic protein. The secondary structure of MwCP was mainly composed of α-helices and random coils, and the space structure primarily contained α-helices, β-sheets, and β-turns. Homology analyses showed the 98% homology between MwCP amino acids and a cysteine protease found in *Triticum aestivum* (GenBank accession No. AAW21813.1). Analysis of mRNA using semi-quantitative RT-PCR indicated that during a 48-h drought stress period, *MwCP* was expressed during the 4th hour, and the expression level peaked during the 6th hour before declining to

the original level. The results revealed that *MwCP* was involved in drought-resistant physiological processes of *A. mongolicum*. Moreover, the *MwCP* expression levels were highest in leaves, intermediate in roots, and lowest in stems.

Key words: *Agropyron mongolicum* Keng; Cysteine protease gene; Gene cloning; Expression analysis

