

CHARACTERISTICS OF CYSTATIN GENE ISOLATED FROM SOME PEANUT CREATED BY TECHNOLOGY OF TISSUE CULTURE

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TÓM TẮT:

Cystatins are the inhibitors of cysteine proteinase. Plant cystatins called phytocystatins are grouped in a separate clade of the classification system of cystatins based on the presence of a conserved "LARFAVDEHN" motif. Currently, phytocystatins are being concerned about their relationship with tolerant characteristics of plants such as drought tolerance, cold tolerance, salt tolerance, resistance to harmful microbial and insects, etc. The molecular weights of cystatins range from 12 kDa to 85 kDa. The differences in structure and molecular weight of cystatin are the basis for classification. In this research, cystatin gene was isolated from peanut including less drought-tolerant cultivar L18, fairly drought-tolerant cultivar L23, and two peanut lines generated by plant cell tissue culture technique in different conditions containing L18 callus treatment by blow dry and gamma radiation. Cystatin gene is 461 bp in length, including 1 intron and 2 exons. The sequences of the gene encoding cystatin isolated from peanut line R44 (derived from blown dry callus) and line RM46 (derived from callus under gamma radiation and blow dry) differed from the sequence of which number was AY722693 in GenBank, especially, a deletion mutation of A (position 87) and an insertion mutation of G (position 103) were found. The encoding segment was 297 bp in length which encoded for 98 amino acids. Putative protein of well drought-tolerant line RM48 (derived from callus under gamma radiation at 2Krad associated with continuous blow dry for 9 hours) was different with that of the original cultivar L18 which is less tolerant of about 7.5%. The CY region of cystatin of line RM48 (the most drought tolerant) varied from that of the original cultivar L18 (less tolerant) in seven amino acids at positions 29, 30, 31, 32, 33, 34 and 36; while that of line R44 differed from the origin in one amino acid at position 64. The conservative regions of phytocystatin which were L22A23R24F25A26V27 and Q49V50V51A52G53 in all studied subjects were not detected any change.