Nucleotide sequence of actinidin, a kiwi fruit protease

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The cysteine protease actinidin is abundant in mature kiwifruit. The sequence of a partial cDNA clone (pAc1) of the 1.4 kb mRNA has been reported [1]. We report here the nucleotide sequence of two 1.37 kb cDNA clones synthesised from ripe kiwifruit mRNA (*Actinidia deliciosa* cv 'Hayward') using the RNase H procedure [2].

Both clones, designated pKIWI450 and 451, have identical sequences (shown in Fig 1) except for the length of their polyA tracts. The sequence extends 243 bp 5' to that of pAc1, and is 98% homologous where they overlap (26 base substitutions). An additional 'G' residue found at position 1149 in both pKIWI clones (underlined in Fig 1) was also present in pAc1 when it was resequenced in both orientations. The G adds an extra 8 amino acids to the C-terminal extension. The ATG at position 38-40 has been tentatively designated the initiation codon on the basis of the mRNA size [1], and from comparison with the homologous N-terminal extensions of other cysteine proteases. Thus these data suggest that the mature actinidin protease (220 amino acids) may be translated as a zymogen with N- and C-terminal extensions of 126 and 33 amino acids respectively.

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1 TTTCTTCTAAATTCAAAAACGAGAGAACAA
M G L P K S F U S M S L L F F S T L L I L S L A F N A K N L
38 ATGGGTTTCCCAATTCCTCGTCTCARTGCTCTCTCTCTCTCCACGCTCCTTATACCTCTCATTAGCCCTACACGCCAAACTTG
T Q R T N D E U K A M Y E S W L I K Y G K S Y N S L G E W E
128 ACCCAGAGACAAACGATGAGGTACAGGCCATGTACGAGTCGTGGCTTATCAGTATGGCAATCTTARACTCGCTGGGTGAGTGGGAG
R A F E I F K E T L R F I D E H N A D T N R S Y K U G L N Q
218 AGGAGATTGAGATTTTCAGGAACTTTGAGGTTTCATTGACGAGCACATGACGACCAACCCGATGTACAGGTGGGCTGACCCAG
F A D L T D E E F R S T Y L G F T S G S N K T K U S M R A Y E
308 TTTGCTGACCTGACTGATGAGGAGTTCCGGTCCACTTACTTGGGATTACAGCGGTTCAATAGACGAGGTGAGCAACCGGTACGAG
P A F G Q U L P S Y U D W R S A G A U U D I K S Q G E C G G
398 CCCCGATTCCGACAGATATGCCGAGTTATGTTGATGAGGTCGCGAGGGCGGTGGTGGATATCAATCCCGGGGTGATGTGGGGGT
C W A F S A I A T U E G I N K I U T G V L I S L S E Q E L I
488 TGTGGGCTTTTTCGGCCATCGCCACGGTGGAGGGATCACAAGATAGTGACCGGAGTCTTATTTCACTGTGACAGACAGGCTTATA
D C G R A T Q N T R G C N G G Y I T D G F Q F I I N N G G I N
578 GATTGCGGTAGGACACAAACACCGGGGTCGATGCGGTTACATACCGACGGGTTTCAGTTTCATCATCAACACGGTGGGATTAC
T E E N Y P Y T A Q D G E C N L D L Q N E K Y U T I D T Y E
668 ACCGAGGAAATTTATCCCTACACGGCTCAGATGGTGAATGCACTTGGACTTACAAATGAAGAATGTTTCAATTTGATCTTATGAA
N U P Y N N E W A L Q T A U T Y Q P U S U A L D A A G D A F
758 AATGTTCTTATACACAGAGTGGGCTTGCARACAGCAGTGACATACCACTGTGAGCGTTGCCCTTGACGCCCTGGTGACGCGTTC
K H Y S S G I F T G P C G T A I D H A U T I U G Y G T E G G
848 AAACATTATTATCGGGCATTTTCACTGGACCATGTGGACAGCAATAGACCATGCCGTTACTATTGTTGGATACGGCACAGAGGGAGGT
I D Y W I U K N S W D T T W G E E G Y M A I L R A N U G G A G
938 ATCGACTATTGGATAGTGAARAACCTACGGACGACGCTGGGAGGAGGAGGCTCATGAGGATCTGCGTAAATGTCGAGGTGCTGGA
T C G I A T N M P S Y P U K Y N N Q N H P K P Y S S L I N P P
1028 ACATGTGGAAATGCAACGATGCCATCTTACCCGTCAGTACACACCAACCAATACCCCAACCACTACTCATCTCTATAAATCTCTCC
A F S M S K D G P U G U D D G Q A Y S A *
1118 GCCTTCTCATGAGCAGGATGCCCGAGTGGAGTAGACGATGGACAGGGTACAGCGCTTAGGAAAGATTCAATGAGATGAGGAAGCA
1208 GGGAGAGATGTAGATATATATTGTCATGCAAAATAAAGAACCTTTGCTTTCCAGTTATGGAACTTATGTATTGAATAAGGTGGC
1298 TTCAGGGGATTGTTGTCTCTCTGATACCTGCTCTACTTTTACGTCATATATATAGTAGTGTGCTTTT(Rn) 1370

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Figure 1: Nucleotide sequence of pKIWI450.

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2. Y. Gubler and B. Hoffman (1983). Gene **25**, 263-269.