

Gene Expression Analysis of Fruit Bromelain in Ripening of *Ananas comosus* Cultivar MD 2

Wei Cheng Pang^{1,a}, Aizi Nor Mazila Ramli^{1,2,b*} and Azzmer Azzar Abdul Hamid^{3,c}

¹Faculty of Industrial Science & Technology, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Gambang, Kuantan, Pahang Darul Makmur, Malaysia

²Bio Aromatic Research Centre of Excellence, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Gambang, Kuantan, Pahang Darul Makmur, Malaysia

³Department of Biotechnology, Kulliyah of Science, International Islamic University Malaysia (IIUM), Bandar Indera Mahkota, 25200, Kuantan, Pahang, Malaysia

[a_pangweicheng@outlook.com](mailto:pangweicheng@outlook.com), [b_aizinor@ump.edu.my](mailto:aizinor@ump.edu.my), [c_azzmer@iium.edu.my](mailto:azzmer@iium.edu.my)

ABSTRACT

Fruit bromelain is a proteolytic enzyme harbouring cysteine catalytic residue found abundantly in pineapple fruit. The expression of cysteine proteases is usually regulated during fruit ripening. In the present study, we aimed to study the expression and proteolytic activity level of fruit bromelain during the ripening stage of *A. comosus* cultivar MD 2. The gene expression of fruit bromelain was investigated via relative gene expression analysis using qPCR while the proteolytic activity of fruit bromelain was analysed via enzymatic assay using casein as a substrate. The qPCR analysis revealed that the expression of fruit bromelain was down-regulated 10-fold in ripe pineapple fruits. Besides that, the unripe pineapple fruits [1.9101 ± 0.0831 U/mL] had a higher proteolytic activity than the ripe MD 2 pineapple fruits [1.1333 ± 0.0896 U/mL]. This result showed that the function of fruit bromelain may be related to the protection of young pineapple fruits during the fruit development stage.

KEYWORDS:

Ananas comosus; MD 2; fruit bromelain; qPCR analysis; fruit ripening; pest resistance

DOI: <https://doi.org/10.4028/www.scientific.net/MSF.981.209>

ACKNOWLEDGEMENT

This research was supported by Universiti Malaysia Pahang through research grant RDU180345 and PGRS180362.