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β-mangostin suppresses LA-7 cells proliferation in vitro and in vivo: involvement of antioxidant enzyme modulation; suppression of matrix metalloproteinase and α6β4 integrin signalling pathways

ABSTRACT

ɓ-mangostin (ɓM) was isolated from Cratoxylum arborescens to investigate anti-breast cancer effect in vitro and in vivo. ɓM exhibited an inhibitory effect on the growth of LA-7 cells in vitro with apoptosis formation. In the animal model, ɓM treatment was found to be effective in improving the tissue antioxidant enzymes such as superoxide dismutase and catalase activity (P<0.05). ɓM treatment clearly exhibited apoptosis in mammary tumour tissues, and it was associated with regulation of PCNA and p53. The cDNA microarray gene expression followed by qRT-PCR based validation demonstrated that ɓM could mediate tumour reduction and prevent metastasis by reduction of MMP-9, MMP-13, and MMP-27. Moreover, the reduction of both 14-3-3ɓ and ITGB4 genes indicated the involvement of Ŭɓ4 integrin signalling pathway. These findings showed that ɓ-mangostin is a promising compound candidate as an anti-tumour agent against breast cancer.

Keyword: ɓ-mangostin; Breast cancer; MMP; Ŭɓ4 integrin; Apoptosis; Tamoxifen