

# Recombinant expression of antimicrobial peptides in *Pichia pastoris*: A strategy to inhibit the *Penicillium expansum* in pears

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## Abstract

The alteration of safety-secured yeast is a crucial step before scale applications. Based on previous studies, *Pichia pastoris* showed great potential and value to improve its biocontrol ability. The original sequences of antimicrobial peptide Ac-AMP2 and MiAMP1 were optimized according to the preference of *Pichia pastoris* and ligated into pPICZ $\alpha$ A plasmid which is emerged as a high-performance vector for transformation and expression. The results of RT-qPCR and Western blotting could imply that pPICZ $\alpha$ A/Ac-AMP2 and pPICZ $\alpha$ A/MiAMP1 were successfully overexpressed in *Pichia pastoris* GS115. The peptide concentration of GS115/Ac-AMP2 reached a maximum value of 210 mg L<sup>-1</sup> at 60 h while GS115/MiAMP1 was 220 mg L<sup>-1</sup> at 96 h. The biocontrol experiment indicated that the recombinant strain GS115/Ac-AMP2 and GS115/MiAMP1 could highly suppress the pathogen *Penicillium expansum* in vivo, which was respectively 42% (GS115/Ac-AMP2) and 29.2% (GS115/MiAMP1) of incidence disease lower than the sterile distilled water treatment. In the case of the experimental results considered, the modified GS115/Ac-AMP2 and GS115/MiAMP1 might be promising biological agent in postharvest applications.