



# Acetate ester production by Chinese yellow rice wine yeast overexpressing the alcohol acetyltransferase-encoding gene *ATF2*

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**ABSTRACT.** Acetate ester, which are produced by fermenting yeast cells in an enzyme-catalyzed intracellular reaction, are responsible for the fruity character of fermented alcoholic beverages such as Chinese yellow rice wine. Alcohol acetyltransferase (AATase) is currently believed to be the key enzyme responsible for the production of acetate ester. In order to determine the precise role of the *ATF2* gene in acetate ester production, an *ATF2* gene encoding a type of AATase was overexpressed and the ability of the mutant to form acetate esters (including ethyl acetate, isoamyl acetate, and isobutyl acetate) was investigated. The results showed that after 5 days of fermentation, the concentrations of ethyl acetate, isoamyl acetate, and isobutyl acetate in yellow rice wines fermented with EY2 (pUC-PIA2K) increased to 137.79 mg/L (an approximate 4.9-fold increase relative to the parent cell RY1), 26.68 mg/L, and 7.60 mg/L, respectively. This study confirms that the *ATF2* gene plays an important role in the production of acetate ester production during Chinese yellow rice wine fermentation, thereby

offering prospects for the development of yellow rice wine yeast starter strains with optimized ester-producing capabilities.

**Key words:** Acetate ester; Alcohol acetyltransferase; ATF2; Yeast; Chinese yellow rice wine