

Simultaneous saccharification and ethanol  
fermentation of apples, bananas and potatoes by  
*Issatchenkia orientalis*

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**Abstract**

A local isolate of the dairy associated yeast, *Issatchenkia orientalis* Kudryavtsev, from a mud sample was found ethanologenic. The yeast was isolated on a laboratory medium (M-1) comprising of (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> (5g), KH<sub>2</sub>PO<sub>4</sub> (1g), MgSO<sub>4</sub>.7H<sub>2</sub>O (0.5g), CaCl<sub>2</sub>.2H<sub>2</sub>O (0.1g), NaCl (0.1g) and chloramphenicol (0.05g) and 20 ml ethanol L<sup>-1</sup>, and maintained on yeast malt peptone (YMP) slants and glycerol stocks. The strain was identified from its morphological, cultural and physiological characteristics. Growth conditions of the isolate were optimized. It grew well at pH 8, temperature 37°C with 5% inoculum size and in the presence of aeration (150 rpm). The yeast tolerated 2.5, 5 and 15% ethanol, while produced up to 5.31% ethanol in different laboratory media. However, culturing *I. orientalis* on bananas, apples and potatoes yielded 4.14, 2.71 and 0.77% ethanol, respectively. The yeast hydrolyzed starch and grew on media having 0.5 and 1% cellulose as sole carbon source. This isolate seems promising for ethanol production from waste fruits in one step process and can be employed for starchy materials too. Mutagenesis of the yeast is suggested to improve the ethanol yields.

**Key words:** Saccharification, ethanol, ethanologenic yeasts, *Issatchenkia orientalis*, starch, fruits.