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Short Communication

Ethanol and sugar tolerance of wine yeasts from fermenting cashew apple juice

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Seventeen wine yeasts isolated from fermenting cashew apple juice were screened for ethanol and sugar tolerance. Two species of *Saccharomyces* comprising of three strains of *S. cerevisiae* and one *S. uvarum* showed measurable growth in medium containing 9% (v/v) ethanol. They were equally sugar-tolerant having good growth in medium containing 25% (w/v) glucose. Two of the strains (*S. cerevisiae*) were found to posses higher invertase activities than the remaining two. Further search for industrially useful yeasts in tropical fruits is suggested.

Key words: Ethanol tolerance, Invertase activities, wine yeast, cashew, cashew apple juice.

INTRODUCTION

In assessing a yeast strain for industrial use, specific physiological properties are required (Ekunsanmi and Odunfa, 1990). Ethanol tolerance, sugar tolerance and invertase activities are some of the important properties for use in industrial ethanol production (Jameonoz and Benitez, 1986).

Yeasts have been isolated from many sources for industrial purposes. Such include yeasts isolated from palm wine for industrial production of ethanol (Layokun, 1984), for single cell protein (Amachukwu et al., 1986), for leaving of dough for bread-making (Oakagbue, 1988) and for wine production (Osho and Odunfa, 1999).

Yeasts have also been isolated from many fermenting sources including fermenting cassava tubers (Okafors, 1977; Oyewole and Odunfa, 1988) . Although, the use of cashew apple juice as a substrate for single cell protein has been reported (Layokun et al., 1986; Osho, 1995). No work has been done in assessing the yeasts isolated from cashew juice for any characteristics of industrial importance.

The work reported here was directed at assessing yeasts from fermenting cashew apple juice for ethanol tolerance, sugar tolerance and invertase activities, which are some of the properties required of yeasts to be utilized for industrial ethanol and wine production.

MATERIALS AND METHODS

Isolation of yeasts

The fruits were washed and rinsed many times in distilled water. They were then cut, squeezed and the juice collected in separate sterile flasks. Samples of the juice were diluted serially and 0.1 ml of diluted and undiluted samples were plated on yeast extract peptone-dextrose agar medium (YEPD) supplemented with 0.1 mg/ml streptomycin sulphate as previously described (Osho, 1995). The plates were incubated at 30°C for 24 to 48 h. Morphologically distinguished colonies were then selected under a dissection microscope. The yeasts were purified by subsequent streaking on YEPD medium. Pure culture of each strain was kept on YEPD agar slants and stored at 40°C until needed.

Screening of Yeast for ethanol tolerance

The medium of Novak et al. (1981) was used for the screening of the yeast for ethanol tolerance. The medium was sterilized at 121°C for 15 mm in an autoclave and cooled. Enough absolute ethanol was then added to different flask of the same medium to constitute varying percentages of ethanol differing by 1% (v/v) from one flask to the other. 40 ml portion of the media were distributed into 100 ml conical flask respectively. The media were duplicated and inoculated separately with each of the yeast strain. The initial optical density of each flask was read off on a Pye-Unicam SP6 spectrophotometer at 615 nm against the medium as blank. The inoculated flasks were transferred in a gyrotary shaker incubator set at 150 ppm at 30°C for 72 h. The increase in optical density in a flask was recorded as evidence of growth. The concentration of alcohol at which the growth of the yeast was just inhibited was assessed as the ethanol tolerance of the yeast. Only the yeast strains that showed growth in 9% ethanol (v/v) were further examined.

Sugar tolerance of ethanol-tolerance yeasts

The procedure by Ekunsanmi and Odunfa (1990) was employed. The medium was sterilized by autoclaving at 121°C for 15 min, cooled and inoculated with 0.1 ml of cell suspension of each