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ORIGINAL ARTICLE

Technical Factors Affecting to Production of Sweet Potato Wine

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ABSTRACT
Wine is a popular alcoholic drink. It is prepared from various fruit juices by fermentation. The sweet potato (Ipomoea batatas) is a root vegetable with high starch content. The nutritional composition of sweet potato which are important in meeting human nutritional needs including carbohydrates, fibres, carotenes, thiamine, riboflavin, niacin, potassium, zinc, calcium, iron, vitamins A and C and high quality protein. It has a wide range of uses, including food, beverages, medicines, ceremonial and household objects, fishing bait, and animal feed. In this study, we examine the initial moisture content in sweet potato 77.4%, fermentation temperature 28^{o}C in 120 hours. Ratio of yeast supplementation is 20%, gelatin 1% and sweet potato fluid 30% for wine fermentation.
Keywords: *sweet potato, wine, yeast, fermentation*

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INTRODUCTION

Wine is the product of complex interactions between fungi, yeasts and bacteria that commence in the vineyard and continue throughout the fermentation process until packaging. The sweet potato (*Ipomoea batatas* L.) is a dicotyledon plant that belongs to the family Convolvulaceae. Sweet potato has large, starchy and sweet tasting tuberous roots. The roots are rich in starch, sugars, vitamin C, provitamin A, iron and minerals. Some varieties contain colored pigments such as β-carotene and anthocyanin [2, 9]. These pigments have antioxidant properties possessing health promoting attributes such as ability to fight cancer, protect against night blindness, delay aging and prevent liver injury. The roots are consumed as fresh vegetable or processed by steaming or boiling, baking, frying, roasting, making chips, converting into flour, etc. Roots of some of the cultivars are used for the preparation of beverage, paste, powder, alcohol drink and natural color [3]. Reports on the production of non-alcoholic beverage from sweet potato are available in the literature [1, 8]. An investigation was undertaken to identify the best fermentation process parameters for the production of wine from reconstituted sweet potato (*Ipomoea batatas*) juice and study the effect of storage period and temperature on sensory and optical attributes of wine [7]. They examined the proximate composition and sensory evaluation of anthocyanin-rich purple sweet potato (Ipomoea batatas L.) wine [6]. They conducted the production of wine using sweet potato and also to find an effective combinational resource. Initially, white wine was produced using sweet potato. Through a detailed analysis, it was confirmed that the rate of white wine production was higher in sweet potato when compare to grapes and figs [4]. They reviewed sweet potato postharvest processing and preservation technology [5].
The main purpose of this our research is to investigate the effect of yeast supplementation and fermentation time to the pH change, yeast density and starch residue and ethanol formation.

MATERIAL AND METHOD

Material

Figure 1. Sweet potato

Sweet potato is supplied from the Mekong River Delta, Vietnam. Yeast *Saccharomyces cerevisiae* is originated from Pasteur Institute, HCMC, Vietnam

Research method

Experiment #1: Effect of the yeast ratio, fermentation time to pH change, yeast density, starch residue, and ethanol formation

Moisture content in sweet potato before fermentation is 77.4%. We examine different yeast ratios: 17%, 20%, 23%, 26% fermented at the fixed temperature. Then we determine pH, yeast density, starch residue and ethanol formation

Experiment #2: Effect of sweet potato ratio to wine sensory characteristics

Gelatin 1%. Weigh 50 gram of sweet potato powder + 180 ml of warm water to dissolve it. The ratio of weet potato is 20%, 30%, 40%, 50%. This milk is mixed with flavour and then homoginized to get the pleasant flavour and aroma.

Statistical analysis

All data are processed by Excel.

RESULT & DISCUSSION

Effect of the yeast ratio, fermentation time to pH change, yeast density, starch residue, and ethanol formation

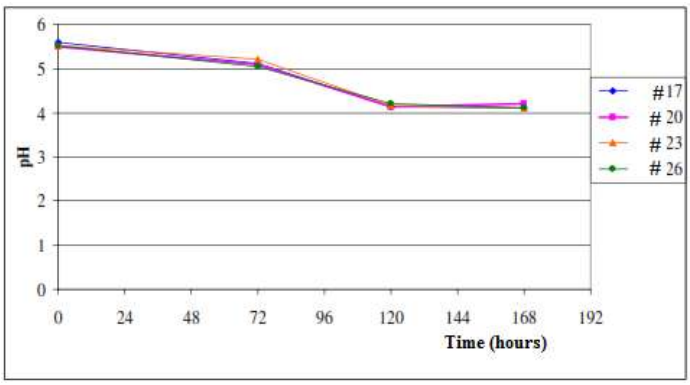

Figure 2. Change of pH values

During fermentation, ethanol is insignificantly difference by pH .

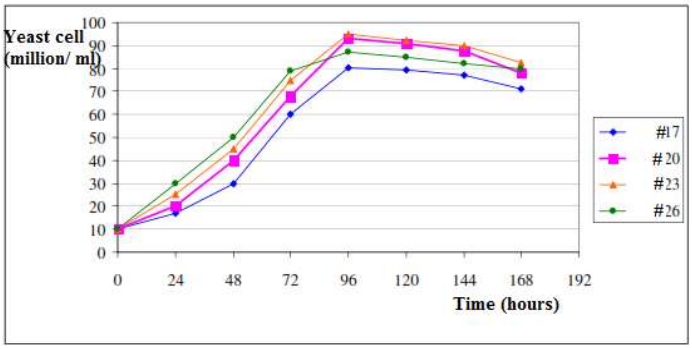

Figure 3. Yeast cell during fermentation

We decide to choose sample with 20% yeast to ferment the sweet potato juice.

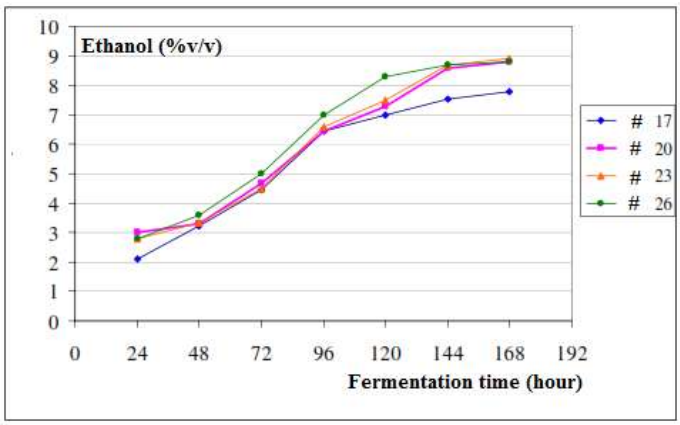

Figure 4. Ethanol formation during fermentation

We decide to choose sample with 20% yeast because it produces more thanol and economic.

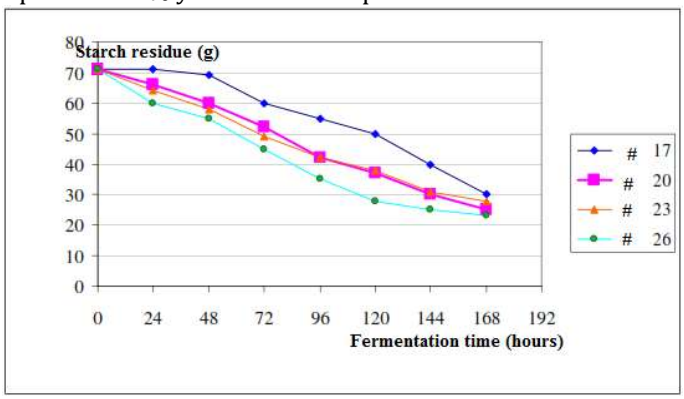

Figure 5. Starch residue by fermentation time

We decide to choose sample with 20% yeast

Effect of the ratio of the milk and sweet potato wine to product sensory characteristics

The sensory evaluating board includes 10 members. Each specialist receives 25 ml of the sweet potato wine in glass beaker at the 22°C. We choose sample with 30% milk with 1% gelatin and 69% sweet potato wine to get the best wine quality.

CONCLUSION

Sweet potatoes (Ipomoea batatas L.) are rich in dietary fibre, minerals, vitamins and antioxidants, such as phenolic acids, anthocyanins, tocopherol and b-carotene. We have successfully investigated the effect of the yeast ratio, fermentation time to pH change, yeast density, starch residue, and ethanol formation during the sweet potato wine fermentation.

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