

Evaluation of the Effect of Hal Bark (*Vateria copallifera*) on Controlling Yeast in Sugar Fermentations

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Abstract

Hal (*Vateria copallifera*) is an endemic plant in Sri Lanka and its bark contains *copelliferol* A and B, two chemicals that have antiseptic properties. It has been reported that Hal bark, containing polyphenolic compounds, can retard microbial activity in various food products. Therefore, the objectives of the present study were to determine, the best drying method for Hal bark, the best method and amount of incorporation of Hal bark into foods, the sensory properties of Hal bark incorporated sugar solutions and the effect of Hal bark on controlling yeast fermentations in sugar solutions.

Hal barks were subjected to four drying methods such as drying at constant humidity, cooling with dehumidifying, sun drying and shade drying. The best drying method was selected by determining whether or not froth was formed within 30 min after adding Hal bark to the sugar solutions. Four sugar solutions 60% (w/v), 30% (w/v), 60% (w/v) with 3g Hal bark and 60% sugar solution boiled with 3g Hal bark and kept overnight, after inoculation 1g of yeast were prepared and the effect of Hal bark and yeast on reducing sugar content was determined. The effect of Hal bark on glucose solution was studied using two glucose solutions added with 3g of Hal bark and without Hal bark. To find out the best amount of Hal bark, different amounts of Hal bark (1g, 2g, and 3g) and bark extract (1ml, 2ml, and 4ml) were added to different strengths of sugar solutions such as 30% (w/v), 40% (w/v), and 50% (w/v). The yeast and mold count was determined using Sabouraud's Dextrose Agar. Sensory properties of Hal bark added sugar solutions were determined using a 5-point hedonic scale.

Cooling with dehumidifying appeared to be the best drying method for Hal bark as it showed the least froth formation in the sugar solution. The best sugar solution to have maximum amount of antiseptic properties was 60%. Addition of Hal bark to fermenting glucose solution decreased the reducing sugar content from 38.6g/100ml to 32.2g/100ml. Hal bark can be incorporated into sugar solutions at a concentration of 1% (w/v) whereas Hal bark extract can be added at a concentration of 2% (v/v) without changing sensory properties. Addition of Hal bark to fermenting sugar solution reduced the yeast population from 10^4 to 10^3 CFU/ml. Sugar solutions incorporated with Hal bark and bark extract showed significantly higher ($P < 0.05$) sensory properties. The results suggest that Hal bark can be used as a natural preservative in sugar related food products such as treacle, honey, candies etc.

Keywords: fermentation, hal bark, reducing sugar, sensory properties, yeast