Storage Stability of Sorghum Bicolor Alcoholic Extract as affected by pH and Temperature

Jordan Bradwell, Philipus Pangloli, Vermont P Dia

Abstract

Sorghum bicolor contains polyphenolics such as 3-deoxyanthocyanins and flavonoids with potential application in food as coloring and health promoting agents. The objective was to determine the stability of methanolic and ethanolic extracts of sorghum as affected by pH (2, 4 and 6) and temperature of storage (4 and 22 °C). The following parameters were measured: polyphenol concentration, absorbance at 490 nm and L*, a* and b* values to monitor changes in color, and concentrations of luteolin, apigenin and naringenin by high performance liquid chromatography. After 10 weeks, polyphenols did not change significantly at pH 2 and 4 samples stored at 4 and 22 °C, but reduced by 58% in pH 6 sample for ethanolic extract and by 42.3% for methanolic extract at 22 °C. Extracts with pH 2 & 6 stored at 22 °C led to increase in absorbance at 490 nm and reduction in L*-values indicating darkening of the extracts which may be associated with browning reaction. Luteolin, apigenin and naringenin were reduced after 10 weeks of storage indicating degradation of these flavonoids. Our preliminary results are important in determining proper storage conditions in order to protect polyphenolics in red sorghum for potential use in food products.

Introduction

Sorghum is the fifth most produced cereal in the world and contains bioactives with potential health-promoting properties1. Anthocyanins are natural pigments responsible for the red, violet, & blue color in fruits and vegetable; they have the potential to be used a natural food colorants2. Flavonoids are polyphenolic health promoting molecules found in many foods; they are known for their ability to modulate cell-signaling pathways3. Antioxidants are substances that prevent or delay some types of cell damage; their primary purpose is to inhibit oxidation of other molecules4.

Materials & Methods

Sorghum Bicolor
Grind sorghum
Store the extracts
Filtration of Extracts

Excision of every two weeks
Measurement of Total Polyphenols (Folin-Ciocalteu method at 630 nm)
Color (*L, *a, *b using Hunter Colorimeter)
Individual Phenolics (Luteolin and Apigenin) by HPLC

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