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Free sugars and non-starch polysaccharides–phenolic acid complexes from bran, spent grain and sorghum seeds**Benoît B Koubala**

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The processing of sorghum seeds to flour used in a wide variety of foods and in traditional African beers known as “Bil-Bil”, leads to Sorghum Bran (SB) and sorghum spent grain (SSG), respectively. Part of these by-products (SB and SSG) is used for animal feed and the rest which is underexploited is thrown as waste in the environment. However, SB and SSG can be value-added sources of dietary fiber (DF). The aim of this study is to characterize free sugars and non-starch polysaccharide-phenolic acid complexes isolated from bran, spent grain and sorghum seeds. Free sugars and non-starch polysaccharide–phenolic acid complexes were isolated from bran, spent grain and sorghum seeds. To perform this, GLC and HPLC methods were used. Total and reducing sugar contents in free sugars were highest in spent grain: 12.56 and 10.47% respectively. The major and minor soluble sugars identified in the samples were significantly different according to the material used. Hemicelluloses B had highest yield while the calcium hydroxide extractable polysaccharides (CHEP) were almost completely soluble. The major sugars identified in the non-starch polysaccharides (NSP) fractions were arabinose, xylose, galactose and glucose. The pentose to hexose ratio was highest in CHEP fractions, the one of spent grain being fourteen-fold than that of bran. Ferulic, coumaric and p-hydroxybenzoic acids were present in all the NSP and absent in the alkaline-insoluble residues. Ferulic acid was the major bound phenolic acid present. Ferulic, coumaric and vanillic acids were identified as the major phenolic acids in CHEP fractions. NSP from sorghum by-products especially CHEP could exhibit high functional properties when added to foods.

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