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Biochemical characterization of defatted flour and protein isolate from broken brazil nut (Bertholletia excelsa Bonpl.)

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Abstract

Brazil nut is an important annual oilseed known in USA and Europe, having Brazil, Bolivia and Peru as the main producer countries. Brazil nuts are considered as a good source of proteins, oil, minerals and dietary fiber. The nutritional composition shows high lipids content (60 to 70 %) and proteins (15 to 20%). Its protein fractionhas highlevels of methionine sulfur amino acid and mineral selenium. This fact makes the product very interesting for applications such as protein isolate or concentrate for food and pharmaceutical industries. Very little work has been done on the biochemical composition of brazil nut and much less about the industrial use of brazil nut broken type. This work aimed to identify protein profile by electrophoresis system containing polyacrylamide and sodium dodecyl sulphate (SDS-PAGE), and amino acid composition by high performance liquid chromatography (HPLC), of brazil nut broken typedefatted flour (BNDF) and of brazil nut broken type protein isolate (BNPI). The electrophoresis SDS-PAGE showed that brazil nut protein consists of proteins with molecular weight between 10,0kDa and 52,0kDa. Brazil nut broken type defatted flour showed six bands with molecular weight of 50,0kDa, 40,0kDa, 25,0kDa, 20,0kDa, 15,0kDa and 10,0kDa, with less intensity. Brazil nut broken type isolate protein showed four bands with molecular weight of 40,0kDa, 25kDa, 20,0kDa, 10,0kDaand no bands with 50,0kDa and 15,0kDa. BNDF and BNPI showed all of the essential amino acid, among them methionine ($2.28 g100g^{-1}$ and $3.98g100^{-1}$) that plays an important role as a sulfur essential amino acid, and its derivative, cysteine ($0.93g100g^{-1}$ e $1.65g100g^{-1}$) that is not essential. Brazil nut matrix is rich in proteins which molecular weight between 9.32kDa and 52.04kDa. The essentials amino acids from BNPImaintain the characteristics of the ones found on BNDFmatrix.

Keywords: Protein fractionation, electrophoresis SDS-PAGE, amino acid.