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摘要: 以黄大豆和黑大豆为原料调制了β-伴大豆球蛋白,用SDS-PAGE和PAS染色分析了黄大豆及黑大豆来源的β-伴大豆球蛋白各个亚基构成及糖含量,并通过体外模拟人体消化方法制备了胃蛋白酶及胰蛋白酶酶解物,利用动物细胞培养的方法分析了两种β-伴大豆球蛋白酶解物对肠道致病菌大肠杆菌(Escherichia coli strains serotype O26)和沙门氏菌(Salmonella typhimurium LT2)粘附Caco-2细胞的抑制作用。结果表明:黄大豆及黑大豆来源的β-伴大豆球蛋白均含有相同的亚基,糖含量上基本一致,为3.5%~3.7%;二者加热处理后再体外消化得到的酶解产物与未加热处理相比可以显著抑制大肠杆菌对Caco-2细胞的粘附,而对鼠伤寒沙门氏菌的抑制作用不明显。这一结果说明,摄取加热后的β-伴大豆球蛋白,在经胃蛋白酶、胰蛋白酶等消化作用后,其消化产物有可能具有保护肠道上皮细胞不被大肠杆菌致病菌粘附的作用。

Abstract: The materials of this study were β-conglycinins extracted from yellow soybean and black soybean, of which we detected the construction of subunits and the content of combining-sugar by sodium dodecylsulfate-polyacrylamide gel electrophoresis (SDS-PAGE) and periodic acid-Schiff (PAS). To investigate the effect on intestinal microbial community, in vitro experiments were conducted using Caco-2 cell line to confirm that in vitro pepsin and trypsin hydrolysates of β-conglycinin from yellow soybean and black soybean had an antiadhesive effect on human intestinal cells against the enteropathogens (Escherichia coli strains serotype O26, Salmonella typhimurium LT2). The results showed that there was no dispartation in both construction of subunits and sugar content of β-conglycinins from the two kinds of soybeans, of which sugar content were 3.5%~3.7%, and their hydrolysates after heat treatment could significantly inhibit the adhesion of Escherichia coli-O26 to Caco-2 cells, while there was no effect against Salmonella typhimurium LT2. Our findings indicated that β-conglycinin probably had an antiadhesive effect on protecting human intestinal cells against the Escherichia coli O26.

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