Research Journal of Pharmaceutical, Biological and Chemical Sciences, 2015, vol.6, N6, pages 1756-1763

Isolation and structural characterization of Rhizoctonia solani fungal lectin

Mukhammadiev R., Bagaeva T.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

In this paper was isolated and purified the lectin of Rhizoctonia solani according to the scheme, comprising the following stages: obtaining protein extract, salting out proteins by the crystalline ammonium sulfate, dialysis, ion exchange chromatography using Bio-Scale ™ Mini Macro-Prep High Q and DEAE-Sepharose columns, gel filtration on the column with Sephadex G-50. The most complete lectin removal was observed at 65% saturation of fungal mycelium buffer extract by ammonium sulfate in 12 hours of salt acting. Ion exchange chromatography by using Mini Macro-Prep High Q and DEAE-Sepharose columns allowed to increase the degree of lectin purification in 26.5 and 41.8 times, respectively, relative to the initial fraction of the glycoprotein. The highest degree of purification was obtained after gel filtration of R. Solani lectin using column with Sephadex G-50. As a result of the experiments there was obtained lectin preparation with 107.54% degree of purification and specific activity of 1.0×10 5 U/mg. The output on the protein activity was 17.2%. By electrophoresis method in denaturing conditions and by gel filtration using Sephadex G-100 it was revealed that the lectin of Rh. solani is a low molecular weight glycoprotein comprising two subunits of molecular weight 18.0 ± 1.5 kDa. The total molecular weight of the native protein is 36.0 ± 2.0 kDa.

Keywords

Lectin, Purification, Rhizoctonia solani