

Title Isolation and structural characterization of the major protein fraction from NorMan flaxseed (*Linum usitatissimum* L.)

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Abstract

Proteins extracted from dehulled and defatted flaxseed (NorMan cultivar) were fractionated by anion exchange chromatography to yield a major fraction with molecular weight of 365,000 Da, as determined by Sephacryl S-300 gel permeation chromatography. Reducing and non-reducing SDS-PAGE revealed three predominant bands (20, 23 and 31 kDa) and two predominant bands (40 and 48 kDa), respectively, as well as several minor bands. Isoelectric focusing separated three components having isoelectric points (pI) of 4.7, 5.1, and 5.6, with acidic (pI 4.5, 5.9, 6.1) and basic (pI 9.6) components being observed under reducing and denaturing conditions. The flaxseed major fraction had high disulfide but low sulfhydryl content, high contents of glutamate (or glutamine) and aspartate (or asparagine), and lower lysine/arginine ratio than soy or canola globulins. FT-Raman spectroscopy indicated high β -sheet content and a strong band near 1065 cm^{-1} , which is typical of intermolecular sheet interactions, supporting the oligomeric nature of the protein.