

B6. Determination of Soluble Carbohydrates in Soybean Seeds

M. G. Choung*, W. Y. Han, S. T. Kang, I. Y. Baek, S. K. Oh, D. C. Shin, S. D. Kim and E. H. Park

National Yeongnam Agricultural Experiment Station.
College of Natural Resources, Yeungnam University.

콩 함유 수용성 탄수화물의 분석

영남농업시험장 : 정명근*, 한원영, 강성택, 백인열, 오세관, 신두철, 김수동
영남대학교 자연자원대학 : 박의호

Objectives :

The purpose of this study is to identify the soluble carbohydrates of soybean seeds using LC/ES-MS, and to determine their contents in soybean seeds.

Materials and Methods :

Materials : The 32 Korean major cultivated soybeans and 468 soybean germplasms.

Liquid Chromatography : The LC separation was performed using an Agilent G1310A Isopump and Shodex RI-71 detector. Chromatography was performed using a Waters Sugar-pak I column and a Waters Carbohydrate column.

Mass spectrometry : Thermo Finnigan AQA single quadrupole mass spectrometer equipped with an ES interface was used.

Results and Discussion :

In generally, soluble carbohydrates of soybean seeds are known as complex carbohydrates. They include simple sugar(monosaccharide) and oligosaccharide. The two monosaccharides (glucose and fructose) and three oligosaccharides(sucrose, raffinose and stachyose)were identified in Korean cultivated soybeans seeds by their chromatographic behavior and results of LC/MS with Electrospray Ionization mode. On the basis of HPLC with a RID detector, the 32 Korean major cultivated soybeans contain $0.37 \pm 0.26\%$ glucose, $4.55 \pm 0.91\%$ sucrose, $1.19 \pm 0.19\%$ raffinose and $2.72 \pm 0.37\%$ stachyose on a dry basis. In 468 soybean germplasms, the ranges of glucose, sucrose, raffinose and stachyose were 0.03~1.15%, 2.33~9.96%, 0.08~1.87% and 0.75~3.18%, respectively. Among 500 soybean samples, the total oligosaccharide contents of 32 Korean major cultivated soybeans and 468 soybean germplasms were varied 5.83~10.06% and 3.66~10.32%, respectively. The composition of glucose, sucrose, raffinose and stachyose in soluble carbohydrates of 500 soybean samples were $2.07 \pm 1.75\%$, $58.01 \pm 5.82\%$, $10.13 \pm 2.28\%$ and $29.80 \pm 4.54\%$, respectively.

Corresponding author - Phone: +82-55-350-1223, E-mail: cmg7004@rda.go.kr