

Pea protein extraction assisted by lactic acid fermentation: Impact on protein profile

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The growing interest of the agri-food industry in plant proteins makes it necessary the obtention of new protein fractions with differentiated characteristics and technological properties. Using new extraction methods may allow the obtention of protein fractions with particular properties. In this study the alkaline solubilization/isoelectric precipitation method has been modified by using fermentation. In fact, the reduction of pH to reach the isoelectric point of proteins has been achieved during fermentation by lactic acid bacteria instead of mineral acid addition. Two lactic acid bacteria strains (*Streptococcus thermophilus* and *Lactiplantibacillus plantarum*) have been used, either alone or in co-culture, and the results have been compared with the conventional acidification. The extraction method has been analysed in terms of protein yield. The albumin rich- and globulin rich-fractions have been characterized in terms of polypeptide profile by SDS-page and SEC-HPLC. Extraction assisted by fermentation has led to the increase in the total protein content of albumin fraction, which means the solubility of pea protein increased. This can be explained by the proteolytic activity of bacteria. That could be also the reason why viciline subunits have been found in the electrophoresis pattern of albumin rich-fraction of the fermented samples. The analysis of the albumin-rich fraction by size exclusion chromatography (SEC-HPLC) has also shown higher amounts of peptides (<10kDa) in samples fermented with co-culture compared to the monoculture and conventional acidification. Clearly the proteolytic action of microbial enzymes plays a key role in the protein composition of obtained fractions. The use of acidifying bacteria during vegetal protein extraction will allow obtaining protein fractions with differentiated protein characteristics. It would be interesting to analyse the effect of fermentation on the antinutritional factors of legumes in order to valorise albumin-rich fraction.