

RuBisCO FROM SPINACH: THE INFLUENCE OF ISOLATION PROTOCOL ON PROTEIN RECOVERY, PURITY AND FUNCTIONAL PROPERTIES

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ABSTRACT

In the era of fast growing world population one of the global challenges is to provide enough food. Also, the need for novel food types for special categories of consumers is in raise. These are the reasons for a constant search for protein sources that would provide lower-cost and healthier alternatives than those derived from traditional ones (wheat, soya, meat), without compromising product quality and safety. One of the possible sources of protein for sustainable food and feed production could be green leaves. Proteins in them comprise two fractions - the white and the green, with the former one containing mainly ribulose-1,5-bisfosfat-carboxylase/oxygenase (RuBisCO) known as the most abundant protein in the world.

The aim of this study was to establish a protocol for efficient and low-cost isolation of RuBisCO that would yield protein with valuable functional properties. Spinach used as raw material was pressed to prepare green juice. Contaminat proteins from green fraction were removed by thermal denaturation, after what two protocols for concentration and partial purification were conducted. One included salting out and dialysis, and the other isoelectric precipitation. Collected protein samples were freeze dried and analyzed for purity by SDS-PAGE and by reducing sugars assay. Results showed that applied protocol affected both protein recovery and purity. Some functional properties of protein samples relevant for their food application such as solubility, water and oil holding capacity were determined. It was revealed that protein samples exhibited favourable functional properties that would enable their advantageous incorporation into food matrix.

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