CAROB PROTEIN HYDROLYSATES AS STABILIZING AGENT IN O/W EMULSIONS

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Hydrolysis can improve the techno-functional properties of several proteins, especially those of plant source that have poor performance compared to animal proteins. In this context, the objective of this work was to evaluate the techno-functional properties of carob protein hydrolysates (CPH) aiming their application as stabilizing agent in O/W emulsions. Carob protein concentrate (CPC) (53% of protein) was hydrolyzed by protease from *Bacillus* sp. to a degree of hydrolysis of 2%. CPC and CPH were evaluated for solubility, zeta potential and antioxidant capacity (ABTS+ and DPPH assays). In addition, the emulsifying properties of O/W emulsions stabilized by CPC or CPH (5% of protein, and 10% of linseed oil, w/w) were evaluated from different parameters as emulsifying activity (EAI), emulsion stability index (ESI) and emulsion stability (backscattering profiles). Enzymatic hydrolysis doubled the protein solubility over a wide pH range (2 to 10), reaching a maximum value at pH 10 (12.12±0.18% and 26.12±2.60% for CPC and CPH, respectively). Hydrolysis process did not affect the zeta potential of the samples, which ranged from 6.52±0.68 to -25.35±2.32 mV for CPC and from 4.79±1.23 to -24.30±1.88 mV for CPH, at pH values from 2 to 10. In addition, the isoelectric point of ~3.5 was found for both protein samples. Antioxidant capacity after carob protein hydrolysis increased from 1,083±10 to 1,243±93 mmol TE/g of protein for the capture of the ABTS+ radical; and from 1,456±10 to 1,684±121 mmol TE/g of protein for the capture of the DPPH radical. There was a slight increase in the EAI when CPC was hydrolyzed, from 5.60±0.21 to 6.06±0.11 m2/s. No effect of enzymatic hydrolysis on the ESI values was observed, which was 236±19 min and 251±25 min for the CPC and CPH, respectively, indicating that both emulsions presented a similar stability. This behavior was confirmed by stability analysis, in which both emulsions showed considerable destabilization after 1h. These results indicate that although hydrolysis did not improve the emulsifying properties of carob protein, an increase in solubility and antioxidant capacity facilitates its application in food products, especially those susceptible to oxidation.