


ORIGINAL
RESEARCH

Antioxidant activities of enzymatic-hydrolysed proteins of dromedary (*Camelus dromedarius*) colostrum

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This work investigated the antioxidant activities of dromedary colostrum proteins before and after hydrolysis by pepsin, trypsin, α -chymotrypsin, pancreatin and papain. The enzymatic hydrolysis affected the degrees of hydrolysis, electrophoretic profiles, molecular weight distribution and hydrophobic/hydrophilic properties of the generated peptides. The antioxidant activities were evaluated using four antioxidant assays, including 2,2-diphenyl-1-picrylhydrazyl (DPPH) and 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) radical-scavenging activities, ferric reducing power and ferrous ion chelating activity. Interestingly, the antioxidant activities of dromedary colostrum proteins were enhanced after enzymatic hydrolysis. The highest antioxidant potential was obtained by pancreatic hydrolysates ($P \leq 0.05$). These results suggest that dromedary colostrum protein hydrolysates are an important source of natural antioxidant peptides.

Keywords Dromedary colostrum proteins, Enzymatic hydrolysis, Protein hydrolysates, Antioxidant activities.

INTRODUCTION

Colostrum is the milk produced by female mammals in the first few days after parturition. Dromedary (*Camelus dromedarius*) colostrum composition differs markedly from dromedary milk since it contains high amounts of whey proteins, essentially immunoglobulins G (IgG) (El-Hatmi *et al.* 2007). Colostral IgG in dromedary are not limited to one subclass (IgG₁) as in bovine colostrum, but they comprise three subclasses (Azwai *et al.* 1996). Other major whey proteins, such as α -lactalbumin, camel serum albumin and lactoferrin, are also present in higher concentrations in dromedary colostrum than in mature milk. β -lactoglobulin, the major protein in bovine colostrum, is absent from dromedary colostrum (El-Hatmi *et al.* 2007). Besides, dromedary colostrum contains little amount of fat and casein compared with mature milk (Jrad *et al.* 2014). This specific protein composition of dromedary colostrum may reveal particular biological activities.

Antioxidant activity is among the fundamental biological activities important for life. The consumption of antioxidants is necessary to avoid oxidative stress, which is implicated in several ailments including neurodegenerative disorders, hypertension, cancer and inflammatory diseases (Zuo *et al.* 2015). Oxidative stress corresponds to an excessive amount of reactive oxygen species owing to an imbalance between their production and destruction. The production of reactive oxygen species is an outcome of metabolic processes in the human body. This latter has its antioxidant defences. However, their limited efficiency cannot prevent all the exogenous oxidative damages such as pollution, psychological and emotional stress, smoking and nutrition (Poljsak *et al.* 2013). Besides, lipid peroxidation in foods, induced by reactive oxygen species, decreases their nutritive value and safety. Several synthetic antioxidants have been employed in food and pharmaceutical industries to act against oxidative deterioration in biological

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