

ΤΕΧΝΟΛΟΓΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΥΠΡΟΥ
ΣΧΟΛΗ ΓΕΩΤΕΧΝΙΚΩΝ ΕΠΙΣΤΗΜΩΝ ΚΑΙ ΔΙΑΧΕΙΡΙΣΗΣ
ΠΕΡΙΒΑΛΛΟΝΤΟΣ



Πτυχιακή εργασία

Αξιολόγηση Φυσικοχημικών και Λειτουργικών
ιδιοτήτων χαρουπάλευρου

Ταμπουκάρη Χρυστάλλα

Λεμεσός 2015

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ABSTRACT

The carob tree is considered an important component of the vegetation in Cyprus for economic and environmental reasons. The carob fruit contains two major parts: the pulp and the seeds. The seeds are extracted to obtain locust bean gum that is added as thickener, stabilizer or flavoring in food industry. Pods are also an excellent source of dietary fibre and polyphenols and contain low amounts of fat. In addition, carob pods can be used as cocoa substitute since they do not contain caffeine and theobromine. The carob is also the base for many snacks and desserts. The major aim of the present study was to investigate the physicochemical and functional properties of carob powder (CAPO). At first, we assessed its physico-chemical properties such as moisture, sugar, protein, fat, total phenolic content (free and bounded) and *in vitro* antioxidant activity. Afterwards, functional properties (water and oil absorption capacity, emulsifying activity and stability, and foaming properties) of four mixtures of CAPO with commercial wheat flour were evaluated. Finally, CAPO at various levels was incorporated in biscuits and their textural properties were evaluated.

Results showed that CAPO lowered the content of moisture, fat and proteins in the mixture of CAPO-wheat flour; whereas the increase of proportion of CAPO caused a dramatic rise of sugars. CAPO also enriched flour mixtures with free and bounded phenolic compounds; the concentration of free phenolics is significantly higher than bounded ones. Interesting functional properties of CAPO were also revealed. In particular, the enrichment of flour mixture with CAPO improved its foaming capacity up to 28%, but the foaming stability was influenced negatively. A significant decrease in emulsifying activity was noted with the increase in concentration of CAPO, while CAPO had no effect on emulsifying stability. In addition, oil and water absorption capacity of flour mixture was affected by the concentration of CAPO. Flour mixtures with low concentration of CAPO had lower water and oil absorption capacities, while these capacities were improved at flour mixtures with high contents of CAPO. Finally, textural properties (hardness, fracture force), thickness and color of biscuits showed the superiority of biscuits enriched with 12.5% CAPO. Overall, CAPO has high potential to be exploited as an ingredient to develop new functional foods.

Keywords: *Ceratonia siliqua*, carob powder, physicochemical properties, biscuits, functional properties, functional food