PREPARATION AND EVALUATION OF SOME HIGH ANTIOXIDANT FUNCTIONAL FOODS

By

SAIED MAHMOUD ABD EL-HAMED BAKR

B.Sc. Agric. Sci. Open Education Center
(Technology and management of agricultural projects)
Ain Shams University, 2013

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ABSTRACT

Saied Mahmoud Abd El-Hamed Bakr: Preparation and Evaluation of some High Antioxidant Functional Foods. Unpublished M.Sc. Thesis, Department of food Science, Faculty of Agriculture, Ain Shams University, 2018.

Effect of aqueous extract of different plant materials green tea (G), rosemary (R) and clove (C) on the radical scavenging activity (RSA), Ferric reducing antioxidant power (FRAP) and reducing power (RP) were investigated. Response surface methodology was applied to optimize the water phenolics and flavonoids extraction conditions to obtain the highest RSA, FRAP and RP effects. Effect of optimized aqueous green tea, rosemary and clove extracts on the different organs under oxidation treatment studied. Two-factor central composite design was established to determine the effects of G, R, C concentrations, temperature and radical scavenging reaction time as independent variables on RSA, FRAP and RP as dependent variable. The optimum G and T were 1.0 % and 88.7°C with predicted RSA 81.3 % (r^2=0.9115) compared to the BHT, which had a scavenging value was 87.4 % at concentration 150 ppm and reaction time 30 min. The same predicted concentration and temperature obtained with the highest FRAP and RP values were 2.566 and 1.687 with r^2 0.9780 and 0.9550, respectively. The optimum R and T were 1.25 % and 71.0°C with predicted RSA 81.17 % (r^2=0.9624) compared to the BHT. The same predicted concentration and temperature obtained with the highest FRAP and RP values were 2.454 and 0.098 with r^2 0.9740 and 0.9560, respectively. The optimum C and T were 0.55 % and 92.5°C with predicted RSA 65.7 % (r^2=0.9743). The same predicted concentration and temperature obtained with the highest FRAP and RP values were 2.468 and 0.117 with r^2 0.7960 and 0.9850, respectively.

The phenolics and flavonoids content were determined in the prepared extracts at optimal predicted conditions after verified the obtained results.

The extract prepared at optimal conditions used in treatment of cirrhotic rats by CCl_4. Total protein and albumin were dramatically decreased in the group treated by CCL_4. The prepared extracts significant ($P \leq 0.05$) protected the liver agents CCL_4 cirrhosis mainly green tea extract compared to the negative and positive control groups. The same trend was observed with studying the transaminase enzymes. Histopathological sections appeared the effect of extracts on the liver cirrhosis retardation in rats.

Key words: Green tea, rosemary, clove, phenolics, flavonoids, radical scavenging activity, ferric reducing antioxidant power, reducing power, antioxidant activity, liver cirrhosis.

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